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"What is the vaunted village of the Beaver, the most ingenious of Quadrupeds, compared with a human city, with its ships and merchandise, its temples, churches, and dwellings, its libraries, and its monuments of art?"—See p. 39.


THE
ANIMAL KINGDOM
Illustrated
by
S. G. GOODRICH.

ILLUSTRATED

NATURAL HISTORY

OF THE

ANIMAL KINGDOM,

BEING

A Systematic and Popular Description

OF

THE HABITS, STRUCTURE, AND CLASSIFICATION OF ANIMALS

FROM THE HIGHEST TO THE LOWEST FORMS,

WITH THEIR RELATIONS TO

AGRICULTURE, COMMERCE, MANUFACTURES, AND THE ARTS.

BY

S. G. GOODRICH.

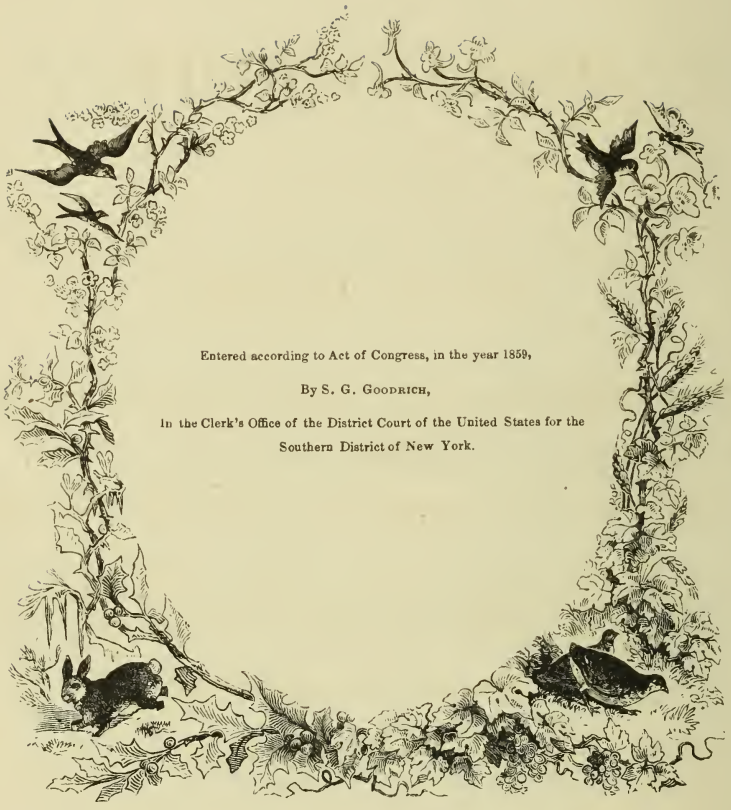
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DEDICATION.

To

LOUIS AGASSIZ,

With his permission, the author respectfully dedicates these pages, as a tribute of esteem for his contributions to science, and still more for the philanthropic spirit with which he has sought to render science an element of universal education.

New York, 1859.



PREFACE.

Although I have stated the plan of this work in a full title-page, and have moreover somewhat enlarged upon it in the Introduction, there seems to me still a propriety in, if not a necessity for, a few detailed remarks, by way of Preface. A little reflection will satisfy any one that my undertaking in these pages is a difficult, if not a hazardous one. I seek to comprise a subject of vast, nay, boundless extent, within the narrow compass of two volumes; I endeavor to reconcile something of the sternness of science with the license of the describer, the narrator, and the anecdotist; I place myself between the Scylla of scientific naturalists on one side, and the Charybdis of popular taste on the other. Therefore, even if a preface be, as is generally held, an author's weakness, I ask the kindly indulgence usually extended to these performances, inasmuch as they are regarded like the plea of a criminal at the bar, and the Public would not pronounce judgment without giving him a hearing.

At the outset, then, I beg to say that this book is not designed for the benefit of scientific naturalists, and yet I hope to obtain their approbation, however defective and deficient it may appear in their view. It is written for the great mass of readers, who have not the means of purchasing the hundreds and thousands of volumes in which the History of Animated Nature is now embodied; for those who do not understand the technicalities of science, and who are, as a matter of necessity, driven from

the pursuit of it by the difficulties with which it is encompassed; for those, in short, who have not time, opportunity, or capacity for scientific research. My design is—while maintaining a systematic arrangement, or in other words, a scientific classification—still to present the subject in a form so simple, and so far divested of technicalities, that any person of common education may read it, understand it, and profit by it. The ultimate object of Natural History is not to furnish an array of hard names in the form of a complicated classification; these, so dear, so significant to the scientific student, are only the means and instruments by which certain practical results are to be attained. They are the skeleton: the blood, the flesh, the palpitating life, consist in what is perfectly appreciable by common minds—the wonderful structure, the beautiful adaptations, the amazing instincts, the admirable powers, the interesting qualities, the prodigious diversities of form, to be traced in the Animal Kingdom. These are revelations which expand the mind, elevate the heart, and inevitably lead the student of nature up to nature's God. These are the beneficent fruits of science; they are the practical results of the profound and toilsome researches of scientific men; and yet, but for some such work as this now presented to the public, they must remain beyond the reach of the million, locked up in quartos, hidden in the libraries of the learned, or at best, seen darkly and confusedly in the dizzying mist of long Greek and Latin names. My task, in comparison with that of those who explore and discover scientific facts, and even of those who merely assign them to their places in the gallery of science, is a humble one, and yet it seems to me necessary to be accomplished, in order to make the world at large participators in the golden fruit of scientific research. I regard myself as a simple interpreter of the language of the gods of science, seeking to make it familiar to this lower world of common men. In this I hope to render a practical homage to science and scientific men, and not merely to make the generation of the living and breathing present share in the fruit of their researches, but to beget a taste for science in the rising generation, and thus—through popular exhibitions of its interesting and useful facts—in the end to train up naturalists who will hereafter themselves contribute to the enlargement of the boundaries of science, and thus make the stupendous labors of those who have gone before, and accumulated the immense mass of truths now embodied in the subject, productive of a double harvest. Therefore it is that, regarding my labors as thus subsidiary to the works of scientific naturalists, I hope for their approbation.

There is another and still larger view of this subject. The Natural History of Animals is one of universal interest to mankind, alike from our constant connection with many of the species, and the curious and interesting facts which their structure, habits, and instincts unfold to the student of nature. It is a subject as full of poetry as of philosophy, of romance as of reason; and it has, moreover, been commended to the popular mind by two remarkable authors—Buffon, who wrote in French, and Goldsmith, who, in translating a portion of his works into our language, even adorned the

original.* Thus Animated Nature was popularized, at least in English, at once and forever. Even now, after the lapse of nearly a century, though science has overturned the systems on which these authors founded their writings, and has proved a multitude of their details to be either imperfect or fabulous, still their felicitous descriptions, their lively anecdotes, their fascinating narratives, continue to be published and republished, as a never cloying feast, for generation after generation.

Nor has this subject been less fortunate in its scientific treatment. Not to speak of Linnæus, who wrote a century ago, and whose great name can never be overshadowed by comparison, George Cuvier, the Master Mind of his age, though by no means neglecting the external qualities of animals, explored with a profound sagacity their internal structure. The result is well known—the new science of Comparative Anatomy, that has waked from their sleep of ages the multitudinous races of extinct animals; and furthermore, Cuvier's example has led to the study of the structure of existing races as the very basis of Scientific Zoology. And what an array of great names has since followed in his track! The general effect is an expansion of the science beyond the comprehension of any single mind, and hence different authors have devoted themselves to special branches, one to insects, nay, often to a single genus of insects; another to reptiles; another to star-fishes; another to the infusoria, and so on.† Often has the whole life of a great man been devoted to the study of a single family, even of the lower forms of life; and this, after all his studies, has been found to have depths yet unsounded. The amazing extent and wonderful developments resulting from these efforts are illustrated in the recent work of Professor Agassiz—*two volumes, quarto, upon American Tortoises*—creatures that creep beneath our feet in the brooks and puddles, many of them familiar to us, all objects of general indifference or contempt, and yet the whole furnishing an example of the most profound research, the most beautiful adaptations, the most wonderful revelations: a theme in the hands of its master, fruitful of the most sublime and inspiring trains of thought. And what has been done in respect to this one class of animals, has been done with more or less ability and success, in respect to a multitude of others.

Nor is this all. Travelers in modern times are naturalists, and those especially who have recently explored new countries, have brought to the general stock a vast mass

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* Goldsmith's "Animated Nature" was not an express translation of Buffon; it was, to a great extent, original; still he followed in Buffon's footsteps, and in some cases translated and in others paraphrased him. When Dr. Johnson was informed that Goldsmith had undertaken this work, he remarked, "He will make it entertaining as a Persian tale;" and Irving, in his life of Goldsmith, says the prediction was fulfilled.

† As an illustration of special study in Natural History, we may mention the Oology of the Birds of North America, by Dr. T. M. Brewer, whose name is so often mentioned by Audubon, Nuttall, &c., as having furnished them with useful ornithological facts. This work, which will make a quarto volume of a thousand pages, is soon to appear under the auspices of the Smithsonian Institution. It will initiate a new branch of study in ornithology, as furnishing the best possible means of determining the species and geographical range of particular genera of birds.

of interesting materials for Natural History. The whole Australian world has been made known in our day, and it has furnished its Ark of Beasts and Birds and Creeping Things—curious, strange, and wonderful—its birds alone filling seven volumes folio! The navies and armies of every civilized nation have now their corps of naturalists, and even the Explorations for a Railroad to the Pacific—a stupendous project, and worthy of great and good results—give to the world whole quartos of the most profound scientific research in respect to our local zoology.* And hence it is that the treatises on Natural History amount to entire libraries. The works consulted by Professor Baird, in the compilation of his *Mammals and Birds of North America*, are in every language of Europe, and comprise, I believe, over two thousand volumes; and all this in addition to his examination of specimens. Such is the vast extent of this subject as presented in the books!

And yet, notwithstanding this affluence of materials, and this grandeur to which the subject has been elevated by the combined labors of the civilized world; notwithstanding its inherent interest, and its general popularity through traditional associations with eminent writers of the past century, it is a remarkable fact, that there is not, in this country, a single publication which even pretends to give a popular view of the Animal Kingdom, as science now presents it. It is to be observed, that nearly all these works which we have mentioned are strictly scientific, and at the same time special, and, in view of the whole science, fragmentary. It is true that in England, France, and more particularly in Germany, there are many popular treatises on Natural History, but these for the most part are confined to particular branches of science—one to birds, another to quadrupeds, another to insects, and another to mollusca, &c. Some of our state governments have caused works on zoology to be published, such as that of New York, issued under the superintendence of Dr. De Kay, that of Massachusetts, by Dr. Storer and others, and that of Ohio, by Dr. Kirtland; but even these clever works are not only in mere outline, but they are local and partial. No one, at least in the English language, has recently ventured upon the attempt to present the whole subject in a comprehensive, popular form. There are condensed scientific outlines, indeed, but these are little more than expanded catalogues or classifications of the whole science, and one of them—that of Dr. Chenu, for instance, now near its completion in Paris—comprises ten volumes quarto! The celebrated classification of the Genera of Birds, by G. R. Gray, published in London in 1849, comprises three volumes quarto, and costs one hundred and fifty dollars! There are also other works giving abridged skeletons or outlines of the whole field; but one suited to the people, or even designed for the general reader, does not exist

* See the two volumes on the Mammalia and Birds of North America, by Professor Baird, of the Smithsonian Institution, and just issued among the documents of the United States Senate; these to be followed by a third volume on Reptiles.

in our language.* And yet the desirableness, nay, the necessity of such a work, is obvious, but who shall attempt to popularize a subject so vast, so boundless? No one has entered upon a task so formidable, if not so hopeless. The audacity, or perhaps the folly, as it may prove, of attempting to supply this want, seems to have been reserved for the author of these pages.

The immense extent of the subject is not the only, nor indeed the chief difficulty with which the compiler has to contend. The popular mind of our day—at least in this country—is too far advanced to be content with mere descriptions of isolated species; all know at least something of classification, and nearly all desire to know more. It would neither satisfy the public, nor be doing justice to the opportunity, in describing animals, to neglect to show them in their relations to other animals. Every beast and bird and reptile and fish has its place in a chain of beings, and neither these individuals, nor the Mighty Plan of Creation, can be at all comprehended unless by treating each in connection with its affiliated genera. Classification, therefore—or in other words, a Systematic Arrangement—was indispensable; and inasmuch as all systems are expressed in technical terms, a considerable array of Greek and Latin words, so frightful to many readers, was inevitable. The scientific writer presumes that his readers understand Latin and Greek as well as their mother tongue. I write for a different class, and am bound to presume that they are not familiar with these languages. While, therefore, I am compelled to use them, I have sought to mitigate the difficulty by abundant explanations of technical terms.

Nevertheless, the skeleton of system and classification remains, and I must reconcile with this, an abundance of details, descriptions, incidents. To hit upon a just balance between these necessities, may demand a nicer judgment than belongs to any man. That I have satisfied the requisitions of the scientific naturalist on the one side, and of the lovers of narrative, anecdote, and illustration, on the other, is indeed my hope, though hardly my expectation. If I am crushed between the two, I shall console myself as well as I may with the consciousness that the attempt was worthy of better success.

To these considerations I have little to add. I may be permitted, however, to notice particularly one principal feature of the work, and that is, the abundance of the engravings. It is admitted that pictures are the best describers of the forms of animals. A single wood-cut will give a more accurate and indelible impression of the personal appearance and aspect of a lion, a giraffe, an eagle, or a hippopotamus, than whole pages of verbal description. I have known children, born and bred in the city,

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* "It is not to be overlooked," says Agassiz, in the preface to his "Contributions to the Natural History of the United States," "that while our scientific libraries are still very defective, there is a class of elementary works upon Natural History widely circulated in Europe, and accompanied with numerous illustrations, which are still entirely unknown in this country." * * * * "There has not been published (in the United States) a single text-book embracing the whole animal kingdom."

on going for the first time into the country, and seeing the milking of the cow, the plowing of the field, the scampering of the lambs, the gambols of the calf, the swimming of the ducks and geese, immediately recognize them as things they had seen in the humble but still speaking wood-cuts in their primers. I have frequently seen children, on going into a menagerie, name the principal beasts, though they had never seen one of them before; but they had become acquainted with them from the wood-cuts in their story-books. Every person must be familiar with similar evidences, derived from his own experience, of the effect of these unpretending illustrations.

Wood engraving, for several reasons, is, indeed, especially adapted to popular works on Natural History. One is the greater economy, so that we are able in this work to give more than fourteen hundred portraits of animals. Another is, that from its nature it is very effective in the representation of feathers and hair, the integuments of birds and quadrupeds; it is hardly less adapted to the representation of the scales of fishes and the shells of mollusca. A still more important reason is, that these engravings are now universally made from drawings on the wood, and the engraver merely cuts out the lights, leaving the shades just as the designer drew them. Therefore, a wood engraving is a *fac simile* of the original design, and hence it is that these generally possess a spirit, life, and verisimilitude, even beyond many copper or lithographic engravings. The "English Cyclopedia of Natural History" asserts that the wood engravings in Bell's and Yarrell's Beasts and Birds of Great Britain—and which, by the way, we have extensively copied in the following pages—are manifestly superior, for the conveyance of accurate impressions of the aspects of animals, to some of the colored engravings in the more imposing books of science. The majestic air of the lion, the sly visage of the fox, the vivacity of the squirrel, the pertness of the wren, the crawling gait of the spider, and indeed all the characteristics of external appearance in animals, except color—all those indeed which mere words cannot convey—are generally more successfully represented in fine wood engravings than in any other.

And finally, what is more important than all in a work like this, for the house and the home, and for daily use, these engravings—being in immediate contact with the descriptive text—are consulted without the trouble of referring to an index and turning over leaves, and are therefore more convenient and useful, as illustrations, than the majority of steel and copper engravings, which are, of necessity, separated from the text.

It is hoped, therefore, that the numerous and clever engravings of this work—more ample than have ever appeared in any similar publication, and inserted, not as mere embellishments, but for the most part as descriptions of animals—may render it acceptable, even if in any other respects it may seem defective.

It may be necessary to state the extent to which this work carries the notice of particular species of animals. As there are a quarter of a million of species in the Animal Kingdom, a very narrow selection for particular description must of course be

made. In the United States there are seven hundred known and described species of birds; more than five hundred recognized species of fish; several hundred mammalia, and reptiles, insects, mollusca, and protozoa without number. In South America, Mexico, and Central America, there are three hundred kinds of humming-birds, and according to Mr. Sclater, in the same regions there are nearly two hundred tanagers, &c. In respect to other parts of the world the multiplicity of species is equally great. In choosing amid this multitudinous mass, I have endeavored to select for description the most remarkable species; and as all could not be noticed, I have chosen those which are representatives of large classes of analogous genera. I may indicate the extent of particular descriptions by saying that I have noticed, with greater or less detail, all or nearly all the species of birds and quadrupeds in Audubon's great work on the Ornithology of North America; in the admirable works of Wilson and Nuttall; in the excellent work of Audubon and Bächman on the quadrupeds of North America; in the able reports of De Kay, Storer, and Kirtland on the zoology of New York, Massachusetts, and Ohio; and in the more recent publication of Cassin on the birds of California, &c.—the only fault of which is its brevity. There is, therefore, I believe, no very important quadruped or bird, in the United States, not noticed here. It is true that there are some species which I have omitted, to be found in Baird's great and important national work on the Mammalia and Birds of North America, issued under the auspices of the government, to which I have already alluded; but these are chiefly of the smaller kinds, and generally belong to the remote and unexplored regions of our continent. The recent acquisitions of Texas, New Mexico, California, and Utah have brought within the bounds of the United States a vast extent of territory, and thus have greatly enlarged the circle of our national fauna; but all the important additions, even within these new territories, have, I believe, a place in the following pages. In respect to other parts of the world, where the species are still more numerous and diversified, the scale of selection is more circumscribed; but still I believe no species of particular interest among the higher orders of animals, either in Europe, Asia, Africa, or Oceanica, has been omitted.

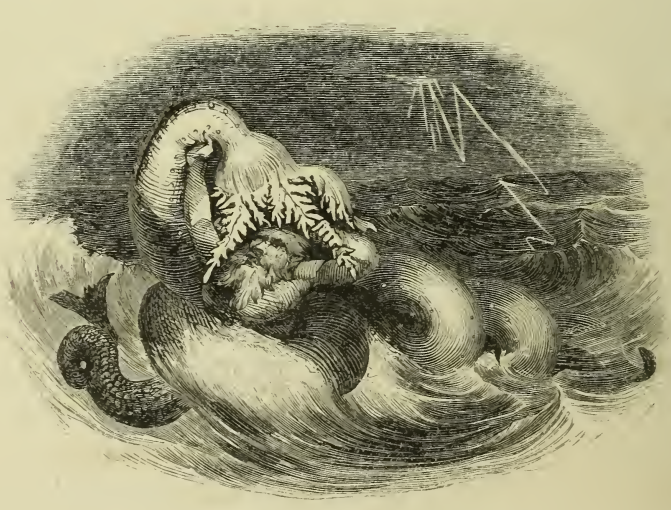
That these volumes, while being primarily designed for popular reading, should also be suited for general reference, is manifest; and this necessity has not been disregarded. In the General Index, at the close of the second volume, references will be found, giving the popular and scientific names, and in most cases the form, size, color, and habitat of more than four thousand species, and these, it is hoped, will be a sufficient key to the whole field, however boundless, of the Animal Kingdom.

Notwithstanding the multiplicity of species in the existing and living races of animals, those which geology has unfolded to our view—the Dead Kingdom of Nature, doubtless as populous as the living—could not be overlooked. It is a stupendous fact, that in all the bones of these extinct generations, the same plan of organization is visible as that which governed the structure of the living races; thus showing that

the same Almighty Mind presided over Creation in ages so remote as to seem on the verge of a past eternity, as in that Adamic Creation which peopled a new and regenerated world. The study of the relics of these lost races often throws great light on the present animal kingdom, and therefore the Natural History of to-day necessarily includes a reference to them. We have therefore, in these pages, given some general notices on this subject, which, with the curious engravings illustrating them, we hope may prove interesting and instructive.

One thing more. In consideration of the frequent use of the French, German, and Italian languages in this country—owing alike to the great number of foreigners among us, the general enlargement of our literature, and the involving of whole territories within our bounds, to many of the people of which one or other of these is a native tongue—we have given the popular names of prominent species of animals in these several languages.

Finally, in view of the whole subject, considering its vast extent, its amazing revelations, its boundless details—curious, strange, wonderful, and all immediately and inevitably traceable to that God whom we worship, in whom we believe, hope, and trust—I cannot but feel that it is well worthy the earnest study of the wise and the simple, the learned and the unlearned. If I have placed it within the reach of an enlarged circle of readers, and if I have succeeded in commending it effectively to their attention, I shall feel that this, my patient labor of some years, has not been in vain.





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ILLUSTRATED NATURAL HISTORY

OF THE

ANIMAL KINGDOM.

INTRODUCTION: THE UNIVERSALITY OF ANIMAL LIFE.

In whatever direction we turn our eyes, we everywhere meet the varied forms of animal life. Earth, air, water, are all alike occupied by multitudes of living creatures, each fitted especially for the habitation assigned to it by nature. Every wood or meadow—nay, every tree or shrub, or tuft of grass—has its inhabitants; even beneath the surface of the ground, numbers of animals may be found fulfilling the purposes for which their species were called into existence. Myriads of birds dash through the air, supported on their feathered pinions, or solicit our attention by the charming song which they pour forth from their resting-places; while swarms of insects, with still lighter wings, dispute with them the empire of the air. The waters, whether salt or fresh, are also filled with living organisms; fishes of many forms and varied colors, and creatures of yet more strange appearance, swim silently through their depths, and their shores are covered with a profusion of polypes, sponges, starfishes, and other animals.

"The sounds and seas, each creek and bay,
With fry innumerable swarm, and shoals
Of fish that with their fins and shining scales
Glide under the green wave, in sculls that oft
Bank the mid sea: part single, or with mate,
Graze the sea-weed their pasture, and through groves
Of coral stray; or sporting with quick glance,
Show to the sun their waved coats dropped with gold;

Or, in their pearly shells at ease, attend
Moist nutriment; or under rocks their food
In jointed armor watch: on smooth the seal
And bended dolphins play: part huge of bulk,
Wallowing unwieldy, enormous in their gait,
Tempest the ocean.

To whatever elevation we attain on the mountain-sides, to whatever depth in the ocean we may sink the lead, everywhere shall we find traces of animal existence, everywhere find ourselves surrounded by living creatures, in a profusion and variety which may well excite our wonder and admiration.

Nor are these phenomena confined to any region of the earth; on the contrary, the diversity of climate only adds to the variety of objects which the zoologist is called upon to contemplate. Thus the bold voyager of the inclement regions of the north, in losing sight of those productions of nature which met his eyes at home, finds, as it were, a new creation in his new abode,—seals, by the hundred, basking in the scanty rays of the Arctic sun, or diving into the deep waters in search of their finny prey,—the whale, rolling his vast bulk in the waves, and ever and anon driving high into the air his curious fountain—water, be it remembered, strained from the myriads of small animals which constitute the food of the leviathan. The air is peopled by innumerable flights of marine birds; the sea by still more countless swarms of fishes; and the land affords a habitation to the elk and the reindeer, the Arctic fox, and other creatures peculiar to those regions.

If we turn our regards southward, to the tropical regions of the earth, the abundance and variety of animated beings increase more and more. Here the colossal elephant and the unwieldy rhinoceros, crash through primeval forests; the lion and the tiger, and other predatory beasts, prowl through the thickets, seeking for their prey; on vast plains, countless herds of antelopes browse in fancied security, or dash swiftly past at the approach of danger; gigantic snakes lie coiled in horrid folds among the bushes, or hang from the trees awaiting their victims. The air and trees swarm with birds of gorgeous plumage, and insects of strange forms and brilliant colors. Nor are the waters less bountifully provided with inhabitants: every form with which we are acquainted in our own seas is here represented, but with still greater profusion and variety.

"Full nature swarms with life. * * *
* * * Through subterranean cells,
Where searching sunbeams scarce can find a way,
Earth animated heaves. The flowery leaf
Wants not its soft inhabitants. Secure
Within its winding citadel, the stone
Holds multitudes. But chief, the forest boughs,
That dance unnumbered to the playful breeze,
The downy orchard, and the melting pulp
Of mellow fruit, the nameless nations feed
Of evanescent insects. Where the pool
Stands mantled o'er with green, invisible,
Amid the floating verdure, millions stray.
Each liquid too, whether it pierces, soothes,
Inflames, refreshes, or exalts the taste,
With varying forms abounds. Nor is the stream
Of purest crystal, nor the lucid air,
Though one transparent vacancy it seems,
Void of their unseen people."

And there is a feature in this abounding animal life of the sea, which strikes the mind as one of the most beautiful provisions of nature. At night, the ocean sparkles with a brilliancy which rivals the splendor even of a tropical sky; and this phenomenon, which may be witnessed, although in an inferior degree, in more temperate climes, is due to the presence of vast multitudes of minute phosphorescent animals, whose very existence would frequently remain unknown, but for their powers of illuminating the waves by night.

And when we have exhausted the study of external nature, there is yet another world to which we may turn. Within our bodies, and those of every species of animal, from the highest to nearly the very lowest, exist various forms of parasites, preying upon our substance or our food: creatures

whose very existence and development are a mystery—a mystery, however, which, as far as it has yet been unraveled, serves to raise our expectations as to what remains behind. As the telescope has revealed myriads of stars beyond the reach of unassisted sight, on account of their distance, so has the microscope unfolded countless generations of beings, as much beyond the reach of vision, on account of their littleness. When we are told that, in addition to what has been previously stated, eight hundred millions of living things may exist in a cubic inch of water, we begin to have some faint conception of the scope of our subject, to which is given the name of *Zoology*, or the Science of Animal Life.

THE EQUILIBRIUM MAINTAINED AMONG ANIMAL TRIBES.

Notwithstanding the variety in size, form, structure, and habits, amidst this profusion of animal life, a due balance of power and number is maintained by the influence of species upon species. They are destined to act and react upon each other by laws of destruction and renovation, through which the proportions of animal existence are preserved in just equilibrium. Multitudes are doomed to become the prey of others—whole races are created as though for slaughter; but, great as is the loss, the increase is equivalent, in order to the preservation of the species. As regards individuals, the instinctive means of attack on the one hand, and of self-preservation on the other, are such as to equalize their respective chances. Speed, caution, watchfulness, inaccessible retreats, the nature of their clothing, and even its color, alike protect the timid and defenceless; while the bolder oppose force to force. Those that are most obnoxious to destruction, are the most prolific. Insects, for example, are the common prey of birds and beasts, reptiles and fishes, and often of each other; yet who has ever known their numbers perceptibly diminished? How great is the daily havoc among fishes! They are the prey of each other: the cachalot, the grampus, the porpoise, the otter, and the seal, devour them in multitudes: thousands of oceanic birds find in them their natural aliment, whilst man draws them by shoals from the deep; such, however, is their astonishing fecundity, that all these losses are duly repaired. The number of eggs in the roe of the codfish has been calculated to be 3,687,760; of the flounder, 1,357,400; of the herring, 36,960; of the mackerel, 546,680; of the smelt, 38,280; of the sole, 100,360; of the tench, 383,250. Of an increase by numbers like these, no examples exist among the higher classes of vertebrata, viz., birds and mammalia: still, the law of the balance of increase and decrease is not the less established among them; hence we justly conclude, that each part of the creation depends upon another; and though, at a single glance, all may seem confusion, it will be found, upon mature reflection, that order and due equipoise of parts are the results of a scheme equally well adapted and wisely ordained.

ADVANTAGES OF THE STUDY OF NATURAL HISTORY.

The advantages attending the study of such a subject as this are obvious. So many animals are directly or indirectly subservient to the necessities, pleasures, or luxuries of man, from so many does he experience direct or indirect injuries, that a knowledge of them is almost indispensable to his existence. Our table, our dress, our household furniture, and a variety of conveniences which we enjoy, will remind us, if we reflect for a moment, of a multitude of animals, which, in one way or other, are essential to our comfort; and we may, with equal ease, form a catalogue of such as, on the contrary, are injurious to our welfare. But, leaving out of the question the necessity thus imposed upon us of gaining a general knowledge of natural objects, we may observe, that the study of natural history is peculiarly fitted for strengthening and enlarging the mind. It disciplines the memory; it demands the exercise of patient investigation; it enforces an attention to minutiæ; it leads us to detect differences, where none but the practiced eye would perceive them, and to trace out analogies, or affinities, which reflection alone can discover. Its aim is truth; and so far, it must be a noble and elevating pursuit. If to correct the imagination, and strengthen the powers of reason, be among the advantages attending the study of the exact sciences, not less beneficial are the results attending the study of Nature. Yet, independently of this consideration, Nature holds out other motives to excite our interest; she asserts her intrinsic value, and, while claiming our admiration of her work, speaks of unerring Wisdom and almighty Power.

THE TEACHINGS OF NATURAL HISTORY.

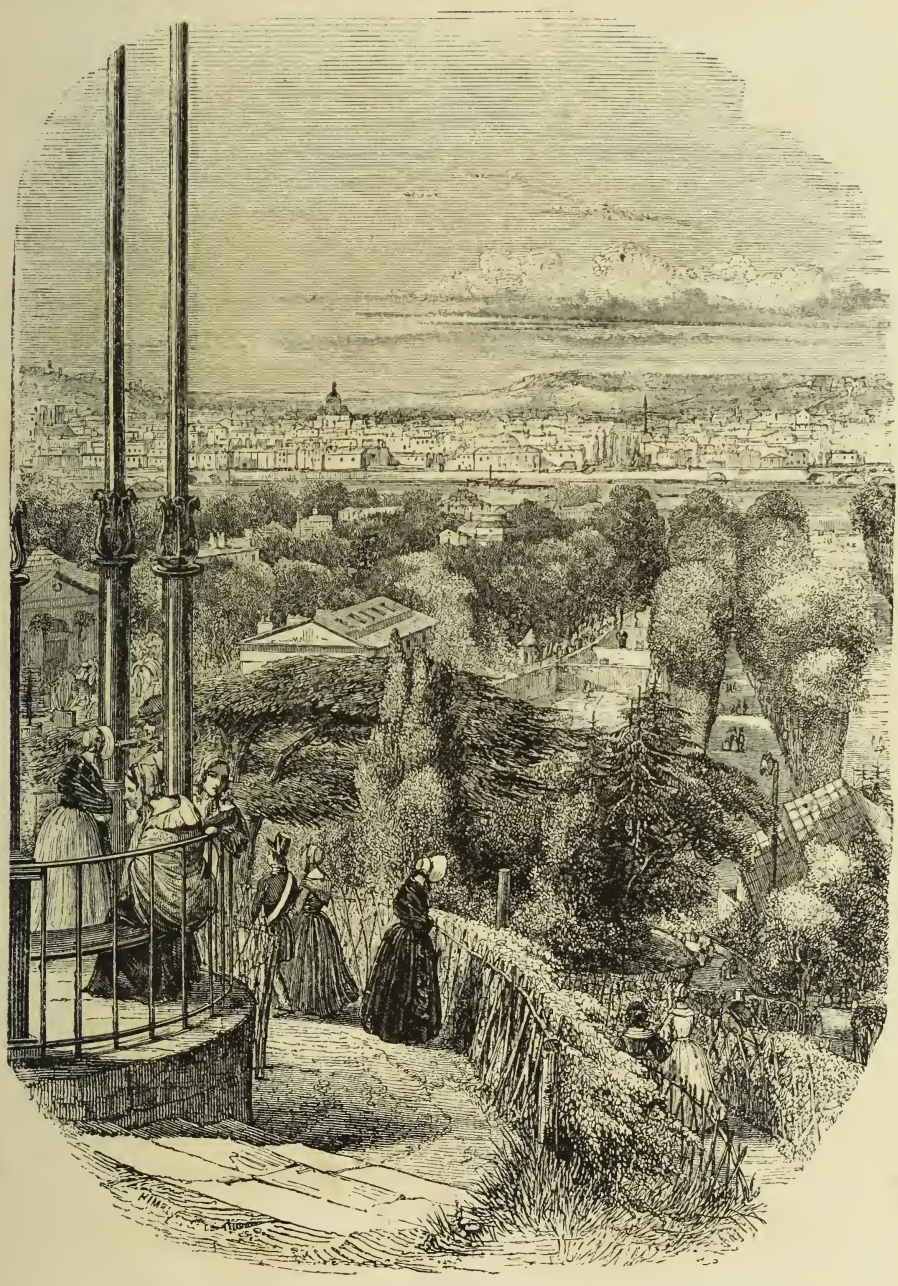
"To every man," says Martin, from whom we derive some of the preceding suggestions, "whose heart is well attuned, whose feelings are pure and undebased, Nature presents a thousand charms. At every step she delights him with new wonders; she invites him to acquaintance, and well is he



GARDEN OF PLANTS, PARIS: ASCENT TO THE SUMMIT.—(See p. 6.)

rewarded who obeys her call. The votary of Nature deems no object unworthy of examination, none destitute of interest; nor does the spirit of philosophic inquiry suffer him to rest satisfied with a casual glance at the multitudinous phenomena around him. He is not content merely to

wonder and admire; but, urged onward, he attempts to trace back effects to their causes; he investigates, he discriminates, he analyzes, he combines, and, still proceeding in his course, endeavors to obtain a glimpse—imperfect it may be—of the mighty plan of creation,—a knowledge of the grand scheme, by which the whole is blended into unity.



GARDEN OF PLANTS: THE "SUMMIT," AND VIEW OF PARIS.—(See p. 6.)

"So various and manifold are the subjects of Nature's empire, that, were the life of one man, however zealous and indefatigable he might be, lengthened out twenty, nay, a hundred times beyond the allotted term, his materials would be unexhausted; he would still have much to study, and, after all, leave a *systema naturæ* to be enlarged and corrected by those who should come

after him. Hence the advantage of co-operating numbers, each working in his favorite department, and contributing his portion of labor to the public good. The result is an accumulated mass of riches, which, transmitted to our immediate successors, may be by them assayed, refined, and increased, and, in due order, passed on to generations following."

THE MYSTERY OF LIFE.

It is quite true, that after all the researches of philosophers, one question of vital interest remains unanswered: What is Life? There is a mystery behind that little word, says Gosse, which no one has yet been able to solve. Science, with the experience of ages, with all the appliances of art, and with all the persevering ingenuity and skill that could be brought to bear upon it, has ardently labored to lift the veil; but philosophy, and science, and art stand abashed before the problem, and confess it a mystery still. The phenomena, the properties of life, are readily observable. We take a bird in our hands: a few moments ago it was full of energy and animation; it shook its little wings as it hopped from perch to perch; its eyes glanced brightly, and its throat quivered as it poured out the thrilling song which delighted us. Now the voice has ceased, the eye is dim, the limbs are stiffening, and we know that it will move no more. Chemical changes have already begun to operate upon its organs; decomposition is doing its work, and soon the beautiful little bird will be a heap of dust. We say that its *life* has gone; but *what* is it that has gone? If we put the body in the most delicate balance, it weighs not a grain less than when it was alive; if we measure it, its dimensions are precisely the same; the scalpel of the anatomist finds all the constituent parts that made the living being; and what the mighty principle is, the loss of which has wrought such a change, alike eludes research and baffles conjecture. We are compelled here to recognize the Great First Cause, and to rest in the reverent declaration, "In Him we live, and move, and have our being."

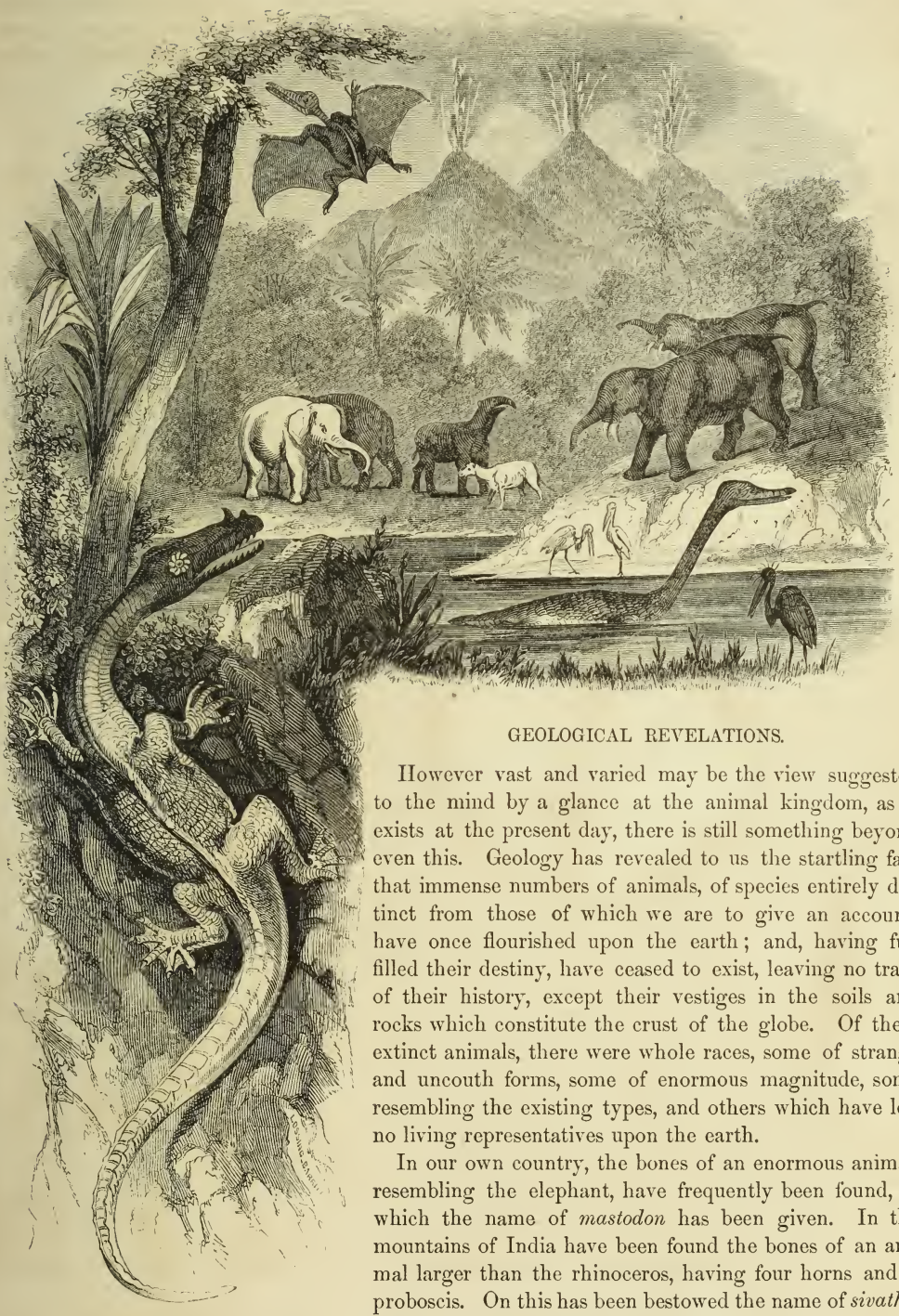
The researches of modern science, however, aided by the inventions which it has brought into existence, though they have been unable to throw a single ray of light on the nature of Life itself, have yet done much to make us familiar with its phenomena. It is a material part of the design of the present volume to acquaint the reader with the more interesting portion of these results.

OBJECT AND SOURCES OF THE PRESENT WORK.

The plan of the author is to give a popular compend of the Natural History of the Animal Kingdom, as it is now found in publications of a professed scientific character. In doing this, he will necessarily lay under contribution the works of the great masters in zoological science, as Linnæus, Cuvier, and Buffon; together with those of numerous authors, distinguished in special branches, as Gervais, Le Maout, T. Rymer Jones, Milne Edwards, Gould, Bell, Yarrell, Forbes, Dallas, Agassiz, Bennett, Newman, Martin, Nuttall, Wilson, Audubon, Bonaparte, and many others; besides the productions of a multitude of travelers who have incidentally described the animal productions of the various countries they have visited. To them, whatever there may be of actual discovery in the following pages, must be credited. The author, however, will be particularly indebted for many lively descriptions of animals to two recent Paris publications on the Garden of Plants, and the two volumes on the Garden and Menagerie of the Zoological Society of London, both illustrated by many clever, because life-like, engravings. It is to the two noble institutions which have given birth to these works, that the world is indebted for a sort of personal acquaintance with many of the rarest and most curious specimens of the animal kingdom, and also for accurate descriptions of a great number of exceedingly interesting animals—birds, beasts, and reptiles; thus, in many cases, dissipating errors which had lingered in works of natural history for hundreds of years.*

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* During my late residence in Paris, the "Garden of Plants" was my favorite resort, not only as a means of studying Natural History, but for the purpose of enjoying its beautiful walks and charming views. The interest thus excited in my mind has led me to undertake the present volume, which I shall be able to enrich by numerous engravings of animals belonging to that celebrated seat of science. The establishment of a similar institution in one of the great cities of the United States, would be worthy the exertions of our wealthy and enlightened citizens.



GEOLOGICAL REVELATIONS.

However vast and varied may be the view suggested to the mind by a glance at the animal kingdom, as it exists at the present day, there is still something beyond even this. Geology has revealed to us the startling fact that immense numbers of animals, of species entirely distinct from those of which we are to give an account, have once flourished upon the earth; and, having fulfilled their destiny, have ceased to exist, leaving no trace of their history, except their vestiges in the soils and rocks which constitute the crust of the globe. Of these extinct animals, there were whole races, some of strange and uncouth forms, some of enormous magnitude, some resembling the existing types, and others which have left no living representatives upon the earth.

In our own country, the bones of an enormous animal, resembling the elephant, have frequently been found, to which the name of *mastodon* has been given. In the mountains of India have been found the bones of an animal larger than the rhinoceros, having four horns and a proboscis. On this has been bestowed the name of *sivatherium*. In the pampas of South America, scattered over an extent of six hundred miles, have been discovered the remains of an animal of the dimensions of an elephant, yet combining the peculiarities of the sloth and the ant-eater. This extraordinary creature has been called the *megatherium*. The *dinotherium*, whose bones have been met with in France and Germany, was larger even than the mastodon, and formed a striking resemblance to the tapir.

Among the amphibious animals, there were creatures of still more extraordinary proportions. One of these, the *ichthyosaurus*, was a fish-lizard, with the teeth of a crocodile, the head of a lizard, and the fins of a whale. The *plesiosaurus* was similar, but still more remarkable. Cuvier asserts that its structure was altogether monstrous. To the head of the lizard it united the teeth of the crocodile, with a neck of enormous length resembling the body of a serpent; it had a trunk and tail of the proportions of an ordinary quadruped, with paddles similar to those of the turtle or whale. Twenty species of this have been discovered, having a general structure like that of the ichthyosaurus. A skeleton is to be seen in the British Museum, eleven feet long, and so nearly perfect, that the form of the original creature may be readily traced. It was probably carnivorous, and lived in shallow seas and estuaries, and breathed the air like the ichthyosaurus and our modern cetacea. The vertebræ of the neck are about thirty-three, equal to those of the longest-necked bird, the swan. This neck was probably of great use in aiding it to seize upon fish beneath the waters, and perhaps flying reptiles and insects. Its tail was so short that it could not have been used, like the tail of fishes, to impel the creature rapidly forward, but was doubtless employed as a rudder to steer him when swimming, as well as to raise or depress him when ascending or descending in the water. Mr. Conybeare, after considering all the characteristics of the animal, draws the following inferences with respect to the habits of the plesiosaurus. "That it was aquatic, is evident from the form of its paddles; that it was marine is almost equally so, from the remains with which it is universally associated; that it may have occasionally visited the shore, the resemblance of its extremities to those of the turtle may lead us to conjecture; its motion, however, must have been awkward on land, and its long neck must have impeded its progress through the water,—presenting a striking contrast to the organization which so admirably fitted the ichthyosaurus to cut through the waves. May it not, therefore, be concluded—since, in addition to these circumstances, its respiration must have required a frequent access of air—that it swam upon or near the surface; arching its long neck like the swan, and occasionally darting it down at the fish which happened to float within its reach? It may, perhaps, have lurked in shoal water along the coast, concealed among the sea-weed, and, raising its nostrils to a level with the surface from a considerable depth, have found a secure retreat from the assaults of dangerous enemies."

The *iguanodon*, whose bones were found in the soil of Tilgate forest, England, was of altogether more monstrous proportions, its length having been probably nearly fifty feet. It was, in fact, a gigantic lizard, bearing a resemblance to the iguana of Brazil. It is supposed that such an animal could only have existed in a hot country, and hence it is concluded that a torrid climate once prevailed in England. The large bones of the iguanodon having been evidently filled with marrow, this, with the form of the bones of the feet, shows that the animal was adapted and designed to move on the land. Its teeth, also, prove that they were remarkably fitted for cropping tough vegetable food, such as the *clatharia*, and similar plants, which are found buried with its bones. As the iguana lives chiefly upon vegetables, it is furnished with long and slender feet, by which it is enabled to climb trees with facility in search of food; but no tree could have borne the weight of the colossal iguanodon. Its movements must have been confined to the land and water, and it is evident that its enormous bulk must have required limbs of great strength. Accordingly, we find that the hind feet, as in the hippopotamus, rhinoceros, and other large mammalia, were composed of strong, short, massy bones, furnished with claws,—not hooked, as in the iguana, but compressed, as in land tortoises; thus forming a powerful support for the enormous leg and thigh. But the bones of the hands or fore-feet are analogous to those of the iguana,—long, slender, flexible, and armed with curved claws; thus furnishing prehensile instruments fitted to seize the palms, arborescent ferns, and dragon-blood plants, which probably constituted the food of the iguanodon.

Another of these fossil mammals was the *pterodactyle*, whose bones were of such strange conformation, that the first specimen discovered was classed by one naturalist as a bird, by another as a species of bat, and by yet a third as a flying reptile. The creature, indeed, combined certain characteristics of all three. The head, and the length of the neck, resemble those of a bird; its wings, in proportion and form, are like those of the bat; while the body and tail approximate in



EXTINCT ANIMALS.

structure to the body and tail of the mammalia. The skull, also, is small, the head being furnished with a beak which has not less than sixty pointed teeth. These singular characteristics, so puzzling to investigators, it was reserved for the genius of Cuvier to reconcile. He ranks the pterodactyles among the most extraordinary of all extinct animals; and if we could see them restored to life, they would strike us as being singularly unlike any thing that exists in the present world. Many species have been discovered, varying from the size of a snipe to that of a cormorant. In external form, these creatures bore a resemblance to the bat or vampire. The snout was elongated like that of the crocodile, and armed with conical teeth. The eye, as appears from the orbit, must have been of enormous size, thus fitting them, like the bat, to fly by night. They resembled the bat also in having fingers, terminating with long hooks, which projected from their wings. They were thus furnished with a powerful paw, which enabled them to creep, or climb, or hang from the trees. It is thought, also, that the pterodactyle, like some existing species of bats in the East, possessed the power of swimming.

As this creature had wings, it was natural to look for the structure of the bird or bat in the bones. The beak, however, had teeth, and the form of a single bone enabled Cuvier to decide that the animal belonged to the lizard tribe, so that it was a kind of flying reptile. The vertebræ of the neck, also, are to those of birds only as six or seven to from nine to twenty-three, while those of the back are in the reverse proportion; the ribs, too, like those of the lizard, are thin and thread-shaped, and thus differ from those of birds, as do the bones of the feet and toes. They are supposed to have fed on insects, and the presence of large fossil dragon-flies and other insects in the same quarries where the pterodactyles are found proves that they existed at the same period, and probably formed a portion of their food. They may also have fed upon fish, and some of the small marsupial animals, or those of the opossum kind, which then existed on the earth. The creature was evidently capable of perching on trees, or standing firmly on the ground, and, by folding its wings, could hop or walk like a bird.

Dr. Buckland, alluding to the peculiarities of the pterodactyle, and the age in which it lived, says: "Thus, like Milton's fiend, qualified for all services and all elements, the creature was a fit companion for the kindred reptiles that swarmed in the seas or crawled on the shores of a turbulent planet.

'The fiend,
O'er bog, o'er steep, through straight, rough, dense, or rare,
With head, hands, wings, or feet, pursues his way,
And swims, or wades, or creeps, or flies.'

"With flocks of such creatures flying in the air, and shoals of no less monstrous ichthyosauri and plesiosauri swarming in the ocean, and tortoises crawling on the shores of the primeval lakes and rivers,—air, sea, and land must have been strangely tenanted in these early periods of our infant world."

In speaking of this age of reptiles, the period of the iguanodon, Dr. Mantell says: "The country it inhabited must have been diversified by hill and dale, by streams and torrents, the tributaries of its mighty rivers. Arborescent ferns, palms, and yuccas constituted its groves and forests; delicate ferns and grasses, the vegetable clothing of its soil; and in its marshes, equiseta, and plants of a like nature, prevailed. It was peopled by enormous reptiles, among which the colossal iguanodon and the megalosaurus were the chief. Crocodiles and turtles, flying reptiles and birds, frequented its fens and rivers, and deposited their eggs on the banks and shoals; and its waters teemed with lizards, fishes, and mollusca. But there is no evidence that man ever set his foot upon that wondrous soil, or that any of the animals which are his contemporaries found there a habitation; on the contrary, not only is evidence of their existence altogether wanting, but, from numberless observations made in every part of the globe, there are conclusive reasons to infer that man and the existing races of animals were not created till myriads of years after the destruction of the iguanodon country,—a country which language can but feebly portray, but which the magic pencil of a Martin, by the aid of geological research, has rescued from the oblivion of the past, and placed before us in all the hues of nature, with its appalling dragon-forms, its forests of palms and tree-ferns, and the luxuriant vegetation of a tropical clime."

These are some of the extinct animal wonders which geology presents to our view. There were, however, almost countless species of others, inferior in size, but often no less curious in their structure and endowments. These include whole races of quadrupeds, birds, fishes, reptiles, insects, and still lower organizations. There is hardly a single existing animal which has not its semblance in this field of fossil wonders. It would seem that for millions of ages the earth has been the theater of a succession of creations of animal forms; and so multitudinous are these, that the crust of the globe is, in great part, composed of their relics. A celebrated author says that "there is hardly an atom of its rocks and soil which has not passed through the complex and wonderful laboratory of life." All the orders of animals, from the highest to the lowest, have contributed to swell the amount of the solid materials of the earth. It is supposed that limestone constitutes one-seventh part of the crust of the globe; and this, with the immense beds of chalk, flint, marl, gypsum, sandstone, lias, and jasper, are all of animal origin. They are, in fact, the bones and shells of the innumerable races which have lived on the earth in ages past, and which, for the most part, have become extinct.

The subject of organic remains constitutes of itself a separate science, to which is given the name of *Paleontology*. The classification of extinct animals has been pursued with great zeal, and nearly 25,000 species have been identified. This is a field of wonders, calculated to enlarge our view of the boundaries of creation; but we must now take leave of it, and give attention to those animal races which constitute the living inhabitants of our globe.

PRELIMINARY REMARKS ON THE CLASSIFICATION OF ANIMALS.

When we consider the immense number of animals existing on the face of the earth, we are soon convinced that an attempt to obtain a knowledge of each of them individually, and without any acquaintance with their mutual relationships, would be a hopeless task. We are, in fact, compelled to call in the aid of some system of classification, which, by bringing together those animals which most resemble each other, and characterizing them by some common point of structure, may enable us to form a general idea of the whole, and thus to remember more readily the peculiarities of each. Some such classification, rough and imperfect as it may be, is, indeed, formed by every observant mind; and its terms find a place in ordinary language. *Beasts*, *birds*, and *fishes*, *reptiles*,



PARALLELISMS BETWEEN QUADRUPEDS AND BIRDS.

and *insects*, are words familiar to every one, and convey to the minds of those to whom they are addressed a more or less definite idea, according to the preconceived notions of the hearer.

Ingenious authors have, at different times, suggested systems of classification, based upon less obvious analogies. Linnæus, for instance, long since remarked a curious parallel between certain classes of quadrupeds and birds, as well in their structure as their habits and destination in the great economy of animal life. A late writer of distinction, M. Le Maout, in his "*Histoire Naturelle des Oiseaux*," has exemplified this in an engraving, which we here insert. On the left hand, in the top of a palm-tree, is seen a monkey, and opposite, in a similar situation, is a parrot. These are severally at the summit of their orders, by reason of their cerebral development. They also approach each other by their capacity for climbing and their habit of living on fruit; both use their limbs for carrying food to their mouth; both are endowed with the instinct of imitation—the one simulating the gestures of mankind, and the other the human voice.

The next types, seen in the top of the engraving, are flesh-eaters—the leopard and the eagle; both subsisting upon living prey; both gifted with the keenest faculties for pursuing and seizing it; both supplied with means to rend and devour it; both remarkable for their ferocity and their rapid and powerful muscular action. Both are seen pursuing the same game—the antelope of the wilderness.

The next types are still flesh-eaters, but of an inferior order, and living upon carrion. One consists of hyenas, the other of vultures; both cowardly, but voracious, and finding a relish in putrefaction; both live in the vicinity of man, and serve as scavengers to remove animal matter, that, in its decomposition, might beget pestilence; both are grouped in the engraving as feasting together on the same carcase.

The next group consists of a tupaia—an animal resembling the squirrel—and a starling; both feeding on insects, and living mostly upon the trees. The next consists of the field-mouse and the sparrow, feeding upon seeds. The next presents a herd of antelopes—ruminants of complex stomachs, feeding on mountain pasturage, with the gallinaceous nepaul, the two horns of which form a close analogy to these animals.

Next comes the dromedary, a ruminant without horns, and living upon herbs in the desert; and the ostrich, with its capacious crop, also herbivorous, and making the desert its home. Finally, we have the seal and the penguin, both possessing abortive limbs, and both plunging under the water for their food.

These analogies are curious and striking, but they are not so obvious and useful, for the basis of scientific arrangement, as the more common grouping to which we have alluded—that of beasts, birds, fishes, and reptiles. The received zoological classification is, in point of fact, to a certain extent, coincident with this popular classification. The latter being the result of observation, the only foundation of natural history, must necessarily be more or less correct, according to the extent to which the different kinds of animals are brought under the notice of mankind; thus we find that tolerably clear notions exist as to the differences between a beast, a bird, and a fish,—these being creatures that pass constantly before our eyes; although, even with respect to these groups, we find some erroneous ideas to prevail.

But with respect to insects, and other lower animals with which mankind at large are not familiar, the classification of ordinary language is by no means so precise; so that while, in the former cases, zoology can adopt the popular groups merely by submitting them to a few modifications, in the latter, science is compelled to invent a system of its own.

This scientific classification is not, however, a mere arbitrary arrangement like that of the words in a dictionary, with the sole object of enabling us to find out all that is known of a given animal in the shortest possible period of time: it has another and a higher purpose in view—that of showing the mutual relations of the various members of the animal kingdom, and tracing, in a manner, the steps taken by the Creator in the modification of the same type to suit the various conditions in which His creatures were to be placed.

OF CERTAIN TERMS USED IN NATURAL HISTORY.

A clear idea of the terms *species*, *variety*, *genus*, *family*, *tribe*, *order*, *class*, and *division*, which are constantly occurring in treatises on natural history, is essential to an understanding of the subject.

Species is applied to the several animals of one kind; thus all the ducks, of one kind, constitute the species. This classification is founded upon similarity of color, size, proportion, form, &c. *Variety* is a term applied to animals which vary in some of their qualities from the general character of their kindred, while they are, in fact, of the same nature and structure. *Genus* is founded upon some of the less important characteristics of anatomy, such as the number and arrangement of the teeth, claws, fins, &c., and usually includes several species. Thus the lion, tiger, jaguar, puma, cat, &c., resemble each other in the qualities of their feet, teeth, and limbs, and therefore constitute a genus called *felis*.

The term *family* is used to designate a group of several genera which have a resemblance to each other. Thus, the sprat, shad, herring, pilchard, and alewives, each forming a genus, constitute the family *Clupeidæ*. The jays, jackdaws, crows, and ravens constitute the family *Corvidæ*. Several of these families combined form an *order*, and several orders constitute a *class*, and classes form *divisions*.

Another word of great use in natural history is *type*, which means the general idea of some animal which combines most fully the characteristics of the group to which it belongs. Thus the falcon may be selected as the type of the hawks, generally; the duck may be taken as the type of the diving birds, generally; and the mallard the type of the duck species.

The knowledge of species constitutes the foundation of all zoological knowledge; without this, we can never arrive at sound generalizations. The *species*, which forms the first step in classification, consists of an assemblage of individual animals which are supposed all to have descended from the same parents, and exhibit the closest possible resemblance in all parts of their structure. This definition, if definition it may be called, must not, however, be taken in the strictest sense which might be applied to the words; for in many cases we find that individuals undoubtedly belonging to the same species vary considerably among themselves, principally in color and size. Variation is generally to be observed, however, in animals under the influence of domestication; the individuals of most species of wild animals resembling each other so closely that it would be difficult to overlook their specific identity.

A test for the specific identity of animals, upon which much stress has been laid, is founded upon the supposed fact, that when two animals of different species breed together, their offspring, called *hybrids*, are barren. This test is evidently applicable only when we can have the animals alive, subject to our notice; while, even under the most favorable circumstances, such observations would be very inconclusive, as hybrids between undoubtedly distinct species have been frequently known to breed.

MODERN SYSTEMS OF CLASSIFICATION.

The arrangement of the species of animals in genera, gives rise to the modern system of zoological nomenclature. This is called the *binomial system*, from the circumstance that, according to this method, every animal receives two names,—one belonging to itself exclusively, the other in common with all the other species of the genus in which it is included. For example, the genus *Felis*, or cat, includes the lion, tiger, leopard, and cat, as species; they all accordingly bear the generic name *Felis*, with the addition of a second name specially applied to each, serving to distinguish it from all other species of the genus: thus the lion is called *Felis leo*, the tiger *Felis tigris*, the leopard *Felis leopardus*, and the cat *Felis catus*. This method of nomenclature has at least this advantage over the plan of conferring only a single name upon each species—that when we hear for the first time the name of a newly discovered animal, if we are at all acquainted with the genus to which it belongs, the mere mention of the name puts us at once in possession of a considerable amount of information as to its structure, form, and habits. It was first adopted by the illustrious Linnæus, the modern founder of Natural History, in the tenth edition of his "Systema Naturæ," published in 1758.

Proceeding with our ascending scale of classification, as indicated above, we find that the genera in their turn are sometimes united by common characters of importance into *families*, and these combine to form *orders*. In some cases we meet with intervening steps, uniting the tribes belonging to one order into two or three subordinate groups. The orders in their turn group themselves

into *classes;* and these lead us up to certain primary *divisions*, which, when put together, constitute the Animal Kingdom.

The classification of Linnæus was an immense improvement upon all that had gone before, and though it is now in a great measure superseded, it is still partially retained and often referred to in modern systems: it may therefore be useful to present it to the reader. It was as follows:

LINNÆAN SYSTEM.

According to this system, the objects comprehended within the animal kingdom are divided into six classes: Mammalia or Mammiferous Animals, Birds, Amphibia or Amphibious Animals, Fishes, Insects, and Worms, which are thus distinguished:

			CLASSES.	
Body	With vertebræ	Hot blood	Viviparous	I. Mammalia
			Oviparous	II. Birds.
		Cold red blood	With lungs	III. Amphibia.
			With gills	IV. Fishes.
	Without vertebræ	Cold white blood	Having antennæ	V. Insects.
			Having tentacula	VI. Worms.

Class. I.—Mammalia.

The first class, or Mammalia, consists of such animals as produce living offspring, and nourish their young ones with milk supplied from their own bodies; and it comprises both the quadrupeds and the cetacea.

This class is divided into seven orders, viz.: *primates*, *bruta*, *ferœ*, *glires*, *pecora*, *belluœ*, and *cetacea* or whales. The characteristics of these were founded, for the most part, on the number and arrangement of the teeth; and on the form and construction of the feet, or of those parts in the seals, manati, and cetacea, which supply the place of feet.

I. Primates.—Having the upper front teeth, generally four in number, wedge-shaped and parallel; and two teats situated on the breast, as the apes and monkeys.

II. Bruta.—Having no front teeth in either jaw; and the feet armed with strong hoof-like nails, as the elephant.

III. Feræ.—Having in general six front teeth in each jaw; a single canine tooth on each side in both jaws; and the grinders with conic projections, as the dogs and cats.

IV. Glires.—Having in each jaw two long projecting front teeth, which stand close together; and no canine teeth in either jaw, as the rats and mice.

V. Pecora.—Having no front teeth in the upper jaw; six or eight in the lower jaw, situated at a considerable distance from the grinders; and the feet with hoofs, as cattle and sheep.

VI. Belluæ.—Having blunt wedge-shaped front teeth in both jaws; and the feet with hoofs, as horses.

VII. Cetacea.—Having spiracles, or breathing-holes on the head; fins instead of fore-feet; and a tail flattened horizontally, instead of hind-feet. This order consists of the narwhals, whales, cachalots, and dolphins.

Class II.—Birds.

The second class, or Birds, comprises all such animals as have their bodies clad with feathers. This part of zoology, being called *Ornithology*, is divided into six orders.

1. *Land Birds.*

I. Rapacious Birds (*Accipitres*).—Having the upper mandible hooked, and an angular projection on each side near the point, as the eagles, hawks, and owls.

II. Pies (*Picœ*).—Having their bills sharp at the edge, somewhat compressed at the sides, and convex on the top, as the crow.

III. Passerine Birds (*Passeres*).—Having the bill conical and pointed, and the nostrils oval, open, and naked, as the sparrow and linnet.

IV. Gallinaceous Birds (*Gallinæ*).—Having the upper mandible arched, and covering the lower one at the edge, and the nostrils arched over with a cartilaginous membrane, as the common poultry.

2. *Water Birds.*

V. Waders (*Grallæ*).—Having a roundish bill, a fleshy tongue, and the legs naked above the knees, as the herons, plovers, and snipes.

VI. Swimmers (*Anseres*).—Having their bills broad at the top, and covered with a soft skin, and the feet webbed, as ducks and geese.

Class III.—Amphibia.

The third class, or Amphibia, included such animals as have a cold, and generally naked body, a lurid color, and nauseous smell. They respire chiefly by lungs, but they have the power of suspending respiration for a

long time. They are extremely tenacious of life, and can repair certain parts of their bodies which have been lost. They are also able to endure hunger, sometimes even for months, without injury.

This class was divided into two orders.

I. Reptiles.—Having four legs, and walking with a crawling pace, as the tortoises, toads, and lizards.

II. Serpents.—Having no legs, but crawling on the body.

Class IV.—Fishes.

This class included inhabitants of the water, which move by certain organs called fins. Those situated on the back are called dorsal fins; those on the sides, behind the gills, pectoral fins; those below the body, near the head, are ventral; those behind the vent are anal; and that which forms the tail is called the caudal fin.

The fishes were divided into six orders.

I. Apodal.—Having bony gills; and no ventral fins, as the eel.

II. Jugular.—Having bony gills; and the ventral fins situated in front of the pectoral fins, as the cod, haddock, and whiting.

III. Thoracic.—Having bony gills; and the ventral fins situated directly under the pectoral fins, as the perch and mackerel.

IV. Abdominal.—Having bony gills; and the ventral fins on the lower part of the body below the pectoral fins, as the salmon, herring, and carp.

V. Branchiostegous.—Having gills destitute of bony rays.

VI. Chondropterygeous.—Having cartilaginous fins, as the sturgeons, sharks, and skate.

Class V.—Insects.

This class comprised the Insects; and the branch of zoology which treats of them is called *Entomology*. It was divided into seven orders.

I. Coleopterous.—Having elytra, or crustaceous cases covering the wings; and which, when closed, form a longitudinal division along the middle of the back, as the cockchafer.

II. Hemipterous.—Having four wings, the upper ones partly crustaceous and partly membranous; not divided straight down the middle of the back, but crossed, or incumbent on each other, as the cockroach.

III. Lepidopterous.—Having four wings covered with fine scales almost like powder, as the butterflies and moths.

IV. Neuropterous.—Having four membraneous and semi-transparent wings, veined like net-work; and the tail without a sting, as the dragon-fly and ephemera.

V. Hymenopterous.—Having four membraneous and semi-transparent wings, veined like net-work; and the tail armed with a sting, as the wasp and bee.

VI. Dipterous.—Having only two wings, as the common house-flies.

VII. Apterous.—Having no wings, as the spiders.

Class VI.—Vermes, or Worms.

These are slow of motion, and have soft and fleshy bodies. Some of them have hard internal parts, and others have crustaceous coverings.

I. Intestinal.—Are simple and naked, without limbs; some of them live within other animals, as the ascarides and tape-worms; others in water, as the leeches; and a few in the earth, as the earth-worm.

II. Molluscous.—Are simple animals, without shells, and furnished with limbs, as the cuttle-fish, medusæ, star-fish, and sea-urchin.

III. Testaceous.—Are animals similar to the last, but covered with shells, as oysters, cockles, snails, and limpets.

IV. Zoophytes.—Are composite animals, and appear to hold a rank between animals and vegetables; though they are in fact true animals, and possess sensation and voluntary motion. In many instances a great number of them inhabit the same stone, but some are soft, naked, and separate. The coral, sponge, and polypes are instances of this order.

V. Animalcules.—Are destitute of tentacula or feelers, and are generally so minute as to be invisible to the naked eye. They are chiefly found in different infusions of animal and vegetable substances.

This classification continued to be the leading one among scientific men, till the publication of the Animal Kingdom of George Cuvier, in 1816. This admirable work, being founded upon a profound study of the structure of animals by means of dissection, was generally adopted; and though portions of it have been modified by the researches of eminent naturalists in particular branches of zoological science, and hence new systems of classification have been proposed and adopted, it still remains as the basis of all those which have acquired reputation with the learned world. This classification is as follows:

THE ANIMAL KINGDOM ARRANGED ACCORDING TO THE SYSTEM OF CUVIER.

ANIMALS,
ARRANGED IN FOUR DIVISIONS, NINETEEN CLASSES, AND SEVENTY-SEVEN ORDERS.

Division I.—VERTEBRATA, arranged in Four Classes and Twenty-seven Orders.	Class I. MAMMALIA, including Eight Orders.	Order	I.	Bimana	Man.
		....	II.	Quadrumana	Chimpanzee.
		....	III.	Carnivora	Hyæna.
		....	IV.	Rodentia	Rat.
		....	V.	Edentata	Armadillo.
		....	VI.	Pachydermata	Hog.
		....	VII.	Ruminantia	Cow.
		....	VIII.	Cetacea	Whale.
	Class II. AVES, including Six Orders.	....	I.	Rapaces	Hawk.
		....	II.	Passeres	Swallow.
		....	III.	Scansores	Woodpecker.
		....	IV.	Gallinæ	Cock.
		....	V.	Grallæ	Heron.
		....	VI.	Palmipedes	Duck.
	Class III. REPTILIA, including Four Orders.	....	I.	Chelonia	Tortoise.
		....	II.	Sauria	Lizard.
		....	III.	Ophidia	Snake.
		....	IV.	Batrachia	Frog.
	Class IV. PISCES, including Two Series. — Series I. Osseous, including Six Orders. — Malacopterygii.	....	I.	Acanthopterygii	Sword-Fish.
		....	II.	Abdominales	Salmon.
		....	III.	Sub-brachiati	Whiting.
		....	IV.	Apodes	Eel.
		....	V.	Lophobranchii	Hippocampus.
		....	VI.	Plectognathi	Sun-Fish.
	Series II. Cartilaginous, or Chondropterygii, including 3 Orders. — Branchiæ fixed.	....	VII.	Sturiones	Sturgeon.
		....	VIII.	Selachii	Ray.
		....	IX.	Cyclostomi	Lamprey.
Division II.—MOLLUSCA, arranged in Six Classes and Fifteen Orders.	Class I. CEPHALOPODA, having One Order.	....	I.	Cephalopoda	Nautilus.
	Class II. PTEROPODA, having One Order.	....	I.	Pteropoda	Clio australis.
	Class III. GASTEROPODA, including Nine Orders.	....	I.	Pulmonia	Snail.
		....	II.	Nudibranchia	Glaucus.
		....	III.	Inferobranchia	Linguella.
		....	IV.	Tectibranchia	Bursatella.
		....	V.	Heteropoda	Carinaria.
		....	VI.	Pectinibranchia	Whelk.
		....	VII.	Tubulibranchia	Vermetus.
		....	VIII.	Scutibranchia	The Sea-Ear.
		....	IX.	Cyclobranchia	Chiton.
	Class IV. ACEPHALA, including Two Orders.	....	I.	Testacea	Oyster.
		....	II.	Acephala	Ascidia.
	Class V. BRACHIOPODA, having One Order.	....	I.	Brachiopoda	Lingula Anatina.
	Class VI. CIRRHOPODA, having One Order.	....	I.	Cirrhopoda	Barnacle.
Division III.—ARTICULATA, arranged in Four Classes and Twenty-four Orders.	Class I. ANNELIDA, including Three Orders.	....	I.	Tubicola	Amphitrita.
		....	II.	Dorsibranchia	Amphinomæ.
		....	III.	Abranchia	Leech.
	Class II. CRUSTACEA, divided into 2 Sections. — Section I. Malacostracia, divided into Five Orders. — Compound eyes placed on pedicles and movable.	....	I.	Decapoda	Gebia stellata.
		....	II.	Stomapoda	Phyllosoma.
	Eyes sessile and immovable.	....	III.	Amphipoda	Gammarus.
		....	IV.	Læmodipoda	Whale-Louse.
		....	V.	Isopoda	Anilocra.
	Section II. Entomostracia, divided into Two Orders.	....	VI.	Branchiopoda	Branchipus (Cancer stagnalis) ?
		....	VII.	Pœcilopoda	Dichelestium.
	Class III. ARACHNIDA, including Two Orders.	....	I.	Pulmonata	Phrynus. (Spider.)
		....	II.	Trachearia	Phalangium.
	Class IV. INSECTA, including Twelve Orders.	....	I.	Myriapoda	Centipede.
		....	II.	Thysanoura	Velvet Spring-Tail.
		....	III.	Parasita	Louse.
		....	IV.	Suctoria	Flea.
		....	V.	Coleoptera	Beetle.
		....	VI.	Orthoptera	Grasshopper.
		....	VII.	Hemiptera	Aphis.
		....	VIII.	Neuroptera	Ant-Lion.
		....	IX.	Hymenoptera	Ichneumon-Fly.
		....	X.	Lepidoptera	Moth.
		....	XI.	Rhipiptera	Xenos.
		....	XII.	Diptera	Gnat.
Division IV.—RADIATA, arranged in 5 Classes and 11 Orders.	Class I. ECHINODERMA, including Two Orders.	....	I.	Pedicellata	Star-Fish.
		....	II.	Echinoderma	Sipunculus.
	Class II. INTESTINA, including Two Orders.	....	I.	Cavitaria	Cerebratula. (Filaria.)
		....	II.	Parenchyma	Planaria cornuta.
	Class III. ACALEPHA, including Two Orders.	....	I.	Acalepha (simple)	Medusa.
		....	II.	Hydrostatica	Diphyes.
	Class IV. POLYPI, including Three Orders.	....	I.	Actinia	Green Actinia.
		....	II.	Gelatinosa	Cristatella.
		....	III.	Corallina	Coral.
	Class V. INFUSORIA, including Two Orders.	....	I.	Rotifera	Wheel Animalcule.
		....	II.	Homogenea	Globe Animalcule.



SPONGES AND CORALLINES: DIVISION PROTOZOA.

ANALYSIS OF THE SYSTEM OF CLASSIFICATION ADOPTED IN THIS WORK.

In this volume we shall adopt a system of classification suited to the present improved state of zoological science. It may be well to indicate, at this point, the mode of analysis by which this arrangement is reached.

But it is necessary first to state that modern investigations, aided by the wonderful powers of the microscope, have enabled scientific men to analyze the various substances of which the bodies of animals are composed, and to reduce them into their elements. Numerous and varied as are these substances—bone, cartilage, sinew, nerve, muscle, hair, teeth, nails, claws, even the transparent lens of the eye—all are reducible to one kind of structure, and this is a *cell*. All organic substances are made up of cells. The primary organic cell is a minute pellucid globule, invisible to the naked eye, and containing within it a smaller cell, called the *nucleus*, which again contains a still more minute granule, called the *nucledus*, or little nucleus. Even the highest animals, in the early development of the embryo, are composed entirely of *nucleated cells*, which afterward assume the forms peculiar to the various tissues of which their bodies are composed.

At the lowest point of the animal kingdom, verging so closely on the lowest forms of plants as to leave us at first in doubt to which of the great divisions of organized nature they should be referred, we meet with a series of creatures in which the functions of organic life are performed by its simplest element—the cell. From this circumstance they have received from naturalists the denomination of *unicellular animals*, or PROTOZOA.

These animals, though presented to us in a variety of forms, from the simple monad up to the complicated sponges, consist entirely of elementary nucleated cells, or of aggregations of such cells, in which each still retains, to a certain extent, an existence independent of its fellows, and generally possesses the power, when separated from its attachments, not only of continuing its own life, but even of producing another compound structure similar to that from which it had been detached. These simple creatures possess no digestive cavity, their food, when solid, being received into the substance of the body, and there gradually assimilated. The nervous and vascular systems are equally deficient; in fact, the nucleus, which is an essential portion of the elementary cell, and one or more contractile vesicular spaces, are the only traces of internal organization observable in the clear gelatinous substance of which they are composed.

Reproduction is effected in general by the division of the substance of the animal: the phenomena of sexuality, which we shall meet with in all the higher animals, are here never witnessed.

From these simple creatures we pass to a group of animals, the lowest members of which exhibit but little, if any, advance in point of organization. They do not, it is true, consist of isolated cells,



STAR-FISH : DIVISION RADIATA.

or of aggregations of similar independent cells ; but in many instances their bodies and organs are constructed entirely of a gelatinous cellular matter very like that of which the Protozoa are composed, and which appears to possess almost an equal power of retaining vitality in its smallest particles. As we advance in the group, however, we find the organization of its constituent animals growing more and more complicated, from the vital functions becoming more and more differentiated—that is to say, performed by organs specially devoted to each ; until, from creatures roughly shaped out of a homogeneous semi-gelatinous mass, we gradually arrive at animals furnished with distinct nervous and vascular systems, with organs of motion and reproduction.

The most striking character of the animals included in this group consists in the radiate arrangement of their organs, as in the star-fish, round a central axis, which generally passes through the mouth. From this peculiarity they have been denominated by zoologists *radiated animals*, and constitute the division Radiata. This group includes those animals which were formerly supposed to approach very closely to plants, or indeed rather to partake of a sort of mixed nature intermediate between animals and vegetables, hence called *zoophites*, or animal-plants ; and some authors still make use of this name in preference to that of *Radiata*, to indicate the present group.

The nervous system can only be recognized distinctly in the most highly organized of these animals. In these it partakes of the radiate arrangement of the body, the nerve distributed to each division of the body corresponding exactly with those of its neighbor, and arising from a separate center. These centers are all placed in a circle round the mouth, and united by a cord which forms a complete ring.

The sense of touch appears to be the only one which can with certainty be ascribed to these animals; this resides in the general covering or integument, and is also frequently exercised by special organs.

All the Radiata possess a mouth and intestinal cavity; but very few of them have a second opening for the discharge of fecal matters. They generally possess a more or less distinct vascular system : in some of the higher forms a sac-like heart occurs.

Sexual reproduction occurs in all the Radiata, and the sexes are generally on separate individuals. Propagation is also very commonly effected in this division by the formation of buds or gemmules; and these either remain attached to the parent stock, which thus goes on increasing continually in size, or become free, and lead an independent existence.

In the two preceding divisions of the animal kingdom we find the body formed upon two very



SCORPION AND CENTIPEDE: DIVISION ARTICULATA.

different principles. In the first and lowest, it may almost be said to be *amorphous*. The organs, such as they are, follow no particular arrangement; and in many cases it is impossible even to fix their relative position. In the second, however, a certain symmetry is observable; and this is the case also with the remaining groups, the characters of which we have yet to lay before the reader. But this symmetry is of a very different kind: in the *Radiata*, the parts of the body are all grouped around a common axis, every organ being merely a repetition of its fellows; while in those which must now pass under consideration, the organs of the body are arranged more or less distinctly in pairs on each side of the body, so as to produce what has been termed by zoologists a *bilateral symmetry*. In none do we find this mode of construction so completely exhibited as in the animals forming the third primary division of the animal kingdom, to which we must now direct attention.

The most striking peculiarity of these animals, by which—although the division contains an almost infinite variety—insects of all kinds, crabs, lobsters, centipedes, &c.—they may generally be distinguished at the first glance from all other creatures, is, that their bodies and limbs are composed more or less distinctly of segments or rings. From this, which is their most prominent character, they have been denominated *articulated animals*. They are also sometimes called *annulose* or *ringed* animals. These constitute the division ARTICULATA.

The joints or segments of which their bodies are composed are formed essentially by a series of transverse folds in the integument of the animal. In many of the lower forms, the skin still remains perfectly soft and flexible; but in by far the greater number these folds become transformed into a series of horny or crustaceous rings, united to each other by a softer portion of the integument, so as to permit a greater or less degree of flexibility. The limbs, as well as the body, are constructed of rings of various forms; and these, taken together, may be regarded, to a certain extent, as a sort of *external skeleton*, fulfilling, as they do, most of the purposes of the skeleton in man and the animals most related to him. Like this, it gives support to all the soft parts of the body, and furnishes points of attachment for the muscles; which again, by their action on the movable pieces composing it, give rise to the various movements of the creature. In many cases, all the segments composing the body, with the exception, perhaps, of those at the two extremities, are exactly similar,—each presenting the same form and bearing the same organs as its neighbor. An instance of this may be seen in the centipede, figured above; and it is still more strikingly exemplified in many marine worms. Generally, however, the segments present marked differences of form and comparative size, and in the structure of their appendages: this is very distinctly observable in the insects and crabs.



CRABS: DIVISION ARTICULATA.

Every segment is supposed to be capable of bearing two pairs of appendages or members—one connected with the central, the other with the dorsal, portion of the segment. Both pairs of members do in fact occur upon all or a portion of the segments, in some of these animals; but in general, the ventral members alone are developed, and these only on certain segments. In the insects, in addition to three pairs of ventral members or legs, we find generally two pairs of dorsal appendages—the wings. Sometimes, as in the earthworm and leech, the limbs are entirely deficient, or only represented by a few bristles; but, when present, their number is never less than six.

The nervous system of the Articulata generally exhibits the tendency to segmentary repetition, characteristic of the group, very distinctly. In its most characteristic form, it consists of a double nervous cord running down the middle of the ventral portion of the body, and uniting a series of knots or ganglia which lie in its course: these ganglia give rise to nerves which are distributed to the various organs. The more elongated the body, and the more similar the different segments of which it is composed, the more regularly do the ganglia follow one another; while, when the segments become more or less amalgamated, the individual ganglia fuse in a corresponding degree into larger masses. This ventral cord originates from one or more cephalic ganglia of considerable size, situated in the head above the œsophagus, which give off two filaments to join the first ventral ganglion, and thus form a nervous ring surrounding the œsophagus. From this the ventral cord takes its rise.

In the lowest animals arranged in this division we have some difficulty in referring the nervous system to the articulate type; but when these animals present us with a distinct nervous system, it consists of one or two ganglia situated in the neighborhood of the œsophagus, and giving off two thin branches which run down the body.

The majority of the Articulata possess the senses in tolerable perfection. The eyes in many cases present a highly complex structure, consisting of a great number of hexagonal facets, each of which may be regarded as a distinct eye; this construction of the eyes is especially prevalent in insects, and is peculiar to the annulose division. When these eyes are wanting, and even when they are present, we frequently meet with *simple* eyes, which agree very closely in structure with the individual eyes, by the aggregation of which the *compound* visual organs are formed. The senses of hearing, taste, and smell appear also to be possessed by a great many of these creatures; but the organs by which these faculties are exercised can seldom be indicated with any degree of



SPIDERS: DIVISION ARTICULATA.

certainty. The sense of touch of course resides in the general integument; but special organs of touch are also frequently developed.

The mouth is nearly always furnished with several pairs of jaws, placed one behind the other, some serving for the prehension and others for the mastication of food. These jaws open laterally, so that the aperture of the mouth is *vertical*, or in the direction of the axis of the body.

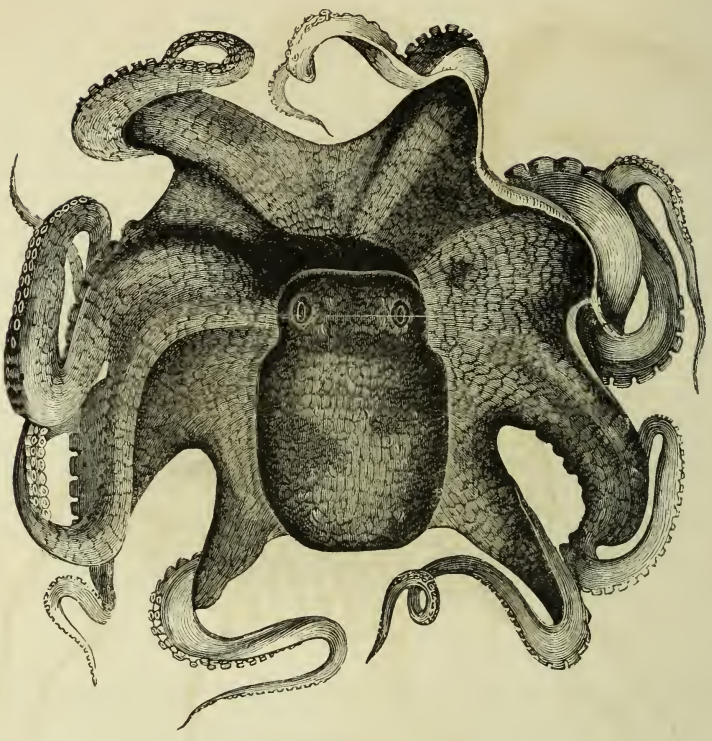
Most of the Articulata have whitish or colorless blood. The only exceptions are to be met with among the worms, some of which have red blood. In these, however, the color of the blood is inherent in the fluid portion, and not due to the presence of red corpuscles. Their circulation is effected by means of a *dorsal vessel*, which carries the blood from behind forward: it returns to the posterior portion of the body, either through a proper vascular system, or by passing through interstices left in the tissues of the body.

Sexual oviparous reproduction prevails throughout this division. The sexes are generally separate, although in some of the lower forms we meet with complete hermaphrodism.

In the fourth great division of animals, the bilateral type of structure is far from being so distinct as in the Articulata. It is still, however, to be recognized in the general arrangement of the external organs, especially of those surrounding the head.

Those animals of which the snail, clam, oyster, and nautilus may be taken as familiar examples, are usually inclosed in a tough skin, to the inner surface of which the muscles are attached, and by its contraction and dilatation the movements of the animal are effected. With the exception of the cuttle-fishes, in which a sort of cartilaginous support is present, none of these creatures possess any thing which can be regarded as analogous to a skeleton; the body forms a soft mass, frequently varying greatly in form at the will of the creature. These peculiarities have led zoologists to give them the name of *molluscous* or soft-bodied animals: they constitute the division Mollusca.

In most of these animals the nervous system consists of a number of knots or ganglia, scattered more or less irregularly through the body, united with each other by nervous filaments, and giving off finer filaments, the true nerves, to the various organs. In the more highly organized Mollusca, three or four of these ganglia are collected in the head, forming a cephalic mass, which represents a brain; but even in its most condensed form, the cephalic ganglia may still be recognized, forming a sort of ring through which the œsophagus passes.



CUTTLE-FISH : DIVISION MOLLUSCA.

Some of the lower forms, arranged with the molluscous animals by modern zoologists, possess only a single ganglion, from which filaments are given off in all directions; and between this and the highly complicated structure, we meet with every conceivable gradation.

As might be expected from the great differences displayed by the members of this division of the animal kingdom, in regard to the degree of development of the nervous system, the senses are possessed by them in very various degrees of perfection. In some of the lowest forms the universal sense of touch appears to be the only one present; but as we ascend in the scale, we meet with creatures more highly endowed in this respect. Tentacles, or special organs of touch, frequently occur, generally in the neighborhood of the head; organs of sight, hearing, smell, and taste make their appearance, until in the highest forms of molluscous animals we find the organs of the senses as fully developed as in many of those belonging to the highest division.

The skin of these animals generally lies loosely about the body, so as to form a sort of cloak or *mantle*. The mantle frequently possesses the power of secreting a hard substance, well known as the *shell*, which serves for the protection of the creature. It increases with the growth of the animal, and varies in form according to the species which inhabits it.

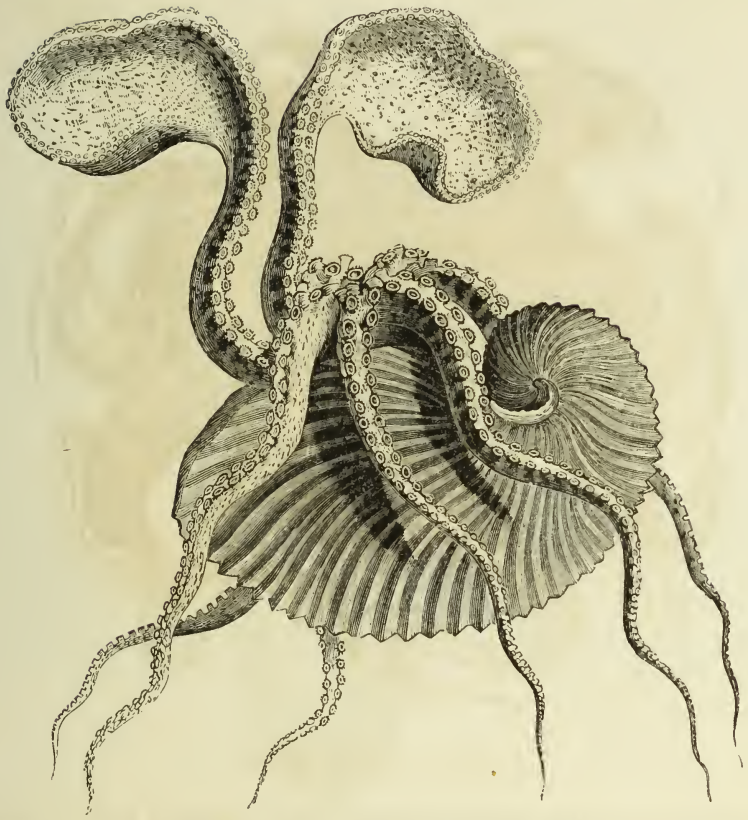
The intestinal canal is very variable in its structure, but always presents two openings—a mouth and an anus; the liver frequently attains a very great degree of development.

The circulatory system is generally very highly organized; a heart, often divided into several compartments, with arteries and veins penetrating all parts of the body, existing in nearly all the Mollusca. The blood is colorless, or nearly so.

The Mollusca are oviparous animals; the male and female organs are frequently in separate individuals, although many species are hermaphrodite.

In the fifth and highest division of the animal kingdom, we meet with a series of organs to which nothing similar occurs in the groups which have already passed under review.

All these animals possess a nervous system, consisting essentially of a brain, inclosed within a bony case, the skull, beneath which the œsophagus passes, and a single cord of nervous matter,



NAUTILUS WITH THE SHELL: DIVISION MOLLUSCA.

originating from the lower part of the brain, passing through a large hole in the base of the skull and running down through a bony canal, formed by the vertebral column, of which the skull is, in fact, only the anterior portion. As this set of organs—the brain and the spinal cord, the skull and the vertebral column—while possessed by no other animals, is, with a few rare exceptions, constantly present in these, its existence will always serve to distinguish them from the rest of the animal kingdom. They are accordingly called *vertebrate animals*, and the division which they form, VERTEBRATA.

These, however, are not the only characters possessed in common by vertebrate animals. The vertebral column forms only a portion of an internal bony framework or skeleton, which serves for the support of the soft portions of the body, and by furnishing the necessary points of attachment for the muscles, assists in effecting the movements of the animal. This framework generally consists of the *vertebral column*, including the *skull;* the *jaws*, which are regarded as appendages of the vertebræ, of which the skull is considered to be composed; the *ribs*, a series of bony arches, articulated at one extremity with the bones of the vertebral column, and at the other either attached to a central bony piece, the *sternum*, or lying perfectly free in the tissues of the body; and the *limbs*, which are never more than four in number. The jaws in these animals always separate in a vertical direction, so that the opening of the mouth is transverse. They all have red blood and a muscular heart. Their reproduction is sexual, and the sexes are never united in the same individual.

The animals constructed upon this type are the most highly organized of living beings. In no others is the nervous matter, the seat of sensation, intelligence, and volition, presented in so concentrated a form; in none are the senses so perfect, or the various functions of the animal economy so completely isolated.

We thus see that animals are constructed upon Five Primary Types or Plans, of which all the varied forms presented by these creatures are but modifications; as though the Creator, in design-



NAUTILUS WITHOUT THE SHELL: DIVISION MOLLUSCA.

ing the animal world, had imposed upon himself, in the beginning, certain fixed rules, from which he would not swerve.

In this manner we obtain Five Groups or Divisions, each of which leads us a step higher than the others—although it is by no means to be supposed that we have here that gradually ascending chain of beings so much talked of, in which every species, from the lowest to the highest, is supposed to form a link. It is merely in their most highly organized members that the mutual superiority or inferiority of these divisions can be recognized; and, as a general rule, it may be said, at all events in respect to the Radiata, Articulata, and Mollusca, that the highest members of each group are considerably more perfectly organized than the lower members of the others. The Protozoa and Vertebrata appear to be exceptions to this rule; for the most highly organized of the former can scarcely be regarded as superior even to the lowest forms of the other divisions, while the fishes, which constitute the lowest members of the vertebrate division, still appear to be more highly organized than the lowest Mollusca.

These five divisions are represented in the following classification, though they are presented in a reversed order, it being more according to our habits of observation to begin the study of the animal kingdom with the highest classes, and thence to proceed to those of a lower grade, as they follow in the places assigned to them.

In regard to this classification, we may remark that, simplicity being a leading object, we have only presented the divisions of *Species*, *Genera*, *Orders*, *Classes*, and *Divisions*, leaving out many subdivisions of *tribes*, *families*, &c., as unnecessary in a table of this nature. In the progress of the work we shall have occasion to repeat, and in some instances to enlarge upon, the outline given in the preceding pages.



CLASSIFICATION.

The Animal Kingdom may be arranged in Five Grand Divisions, as follows:

DIVISION I. VERTEBRATA, or vertebrate animals.
DIVISION II. MOLLUSCA, or soft animals.
DIVISION III. ARTICULATA, or articulated animals.
DIVISION IV. RADIATA, or radiated animals.
DIVISION V. PROTOZOA, or the lowest forms of animals.

These are further subdivided into Classes and Orders, as follows:

DIVISION I. VERTEBRATA:

Animals having a vertebrated backbone, serving as the basis of a bony skeleton or framework, and divided into five Classes and numerous Orders, as follows:

Class I. MAMMALIA: animals that suckle their young, divided into fourteen Orders:

ORDER 1. **BIMANA**, or two-handed, including only the human species.
ORDER 2. **QUADRUMANA**, or four-handed, including the apes, baboons, monkeys, lemurs, the cheiromys or aye-aye, flying lemurs, &c.
ORDER 3. **CHEIROPTERA**, from the Greek, signifying a hand and a wing, including the bats.

ORDER 4. **INSECTIVORA,** insect-eaters, as the mole, shrew, desman, hedgehog, tanrec, banxring, &c.

ORDER 5. **CARNIVORA,** flesh-eaters, including the dog, wolf, fox, jackal, Cape hunting-dog, hyena, earth-wolf, cat, lion, tiger, leopard, jaguar, chetah, cougar, ocelot, lynx, &c., civet, weasel, ferret, polecat, martin, skunk, otter, mink, badger, glutton, ratel, kinkajou, bear, raccoon, coati, and many others.

ORDER 6. **PINNIPEDIA,** animals with feet fitted for swimming, including the seal, sea-lion, sea-bear, and walrus.

ORDER 7. **RODENTIA,** gnawing animals, as the hare, rabbit, Guinea-pig, capybara, agouti, porcupine, beaver, coypu, musk-rat, rat, mouse, hamster, lemming, sand-rat, mole-rat, chinchilla, viscacha, jerboa, dormouse, squirrel, marmot, woodchuck, prairie-dog, &c.

ORDER 8. **EDENTATA,** animals, without front teeth as the ant-eater, pangolin, armadillo, sloth, &c.

ORDER 9. **RUMINANTIA,** ruminating animals, as the ox, musk-ox, yak, bison, buffalo, sheep, goat, prong-buck, gnu, antelope, spring-bok, gazelle, eland, addax, koodoo, nylghau, deer, chamois, giraffe, llama, camel, and many others.

ORDER 10. **SOLIDUNGULA,** solid-hoofed, as the horse, ass, and zebra.

ORDER 11. **PACHYDERMATA,** thick-skinned, as the hog, peccary, hyrax or cony, rhinoceros, hippopotamus, tapir, and elephant.

ORDER 12. **CETACEA,** the whale kind, as the dugong, sea-cow, grampus, narwhal, dolphin, porpoise, whale, &c.

ORDER 13. **MARSUPIALIA,** animals with a ventral pouch, including the phascogale, dasyurus, pouched wolf, banded ant-eater, phalanger, yapock, opossum, bandicoot, koala, kangaroo, wombat, &c.

ORDER 14. **MONOTREMATA,** including the echidna or porcupine ant-eater, and the ornithorhynchus or duck-billed platypus.

Class II. AVES, Birds: divided into eight Orders:

ORDER 1. **RAPTORES,** birds of prey, as vultures, hawks, eagles, and owls.

ORDER 2. **PASSERES,** perching-birds, including an immense variety of species, as the whippoorwill, swift, martin, swallow, roller, trogon, kingfisher, bee-eater, hoopoe, humming-bird, creeper, nuthatch, wren, lyre-bird, warbler, nightingale, redstart, titmouse, wagtail, dipper, thrush, catbird, robin, fly-catcher, king-bird, waxwing, cedar-bird, shrike, jay, magpie, raven, rook, crow, bird of paradise, bower-bird, starling, beef-eater, honey-eater, oven-bird, friar-bird, sun-bird, finch, goldfinch, bullfinch, linnet, sparrow, skylark, meadow-lark, oriole, grosbeak, crossbill, hornbill, and many others.

ORDER 3. **SCANSORES,** climbers, including the toucan, parrot, parakeet, macaw, cockatoo, wryneck, woodpecker, cuckoo, honey-guide, barbet, &c.

ORDER 4. **COLUMBÆ,** doves and pigeons.

ORDER 5. **RASORES,** or scrapers, including the guan, curassow, bush-turkey, mound-bird, peacock, common-fowl, pheasant, Guinea-fowl, turkey, quail, grouse, partridge, &c.

ORDER 6. **CURSORES,** runners, including the ostrich, cassowary, emeu, rhea, bustard, crane, trumpeter, &c.

ORDER 7. **GRALLATORES,** wading-birds, including the lapwing, plover, oyster-catcher, killdeer, bittern, heron, adjutant, stork, ibis, spoonbill, avocet, stilt, curlew, phalarope, coot, mud-hen, snipe, rail, jacana, &c.

ORDER 8. **NATATORES,** diving-birds, including the goose, swan, goosander, merganser, duck, petrel, gull, flamingo, cereopsis, sea-swallow, albatross, darter, gannet, frigate-bird, cormorant, pelican, diver, grebe, puffin, auk, penguin, &c.

Class III. REPTILIA, Reptiles: divided into four Orders, as follows:

ORDER 1. **CHELONIA,** tortoises.
ORDER 2. **LORICATA,** crocodiles and alligators.
ORDER 3. **SAURIA,** lizards.
ORDER 4. **OPHIDIA,** serpents.

Class IV. BATRACHIA, the frog kind: divided into five Orders, as follows:

ORDER 1. **ANURA,** including the tree-frog, common frog, toad, Surinam toad, &c.
ORDER 2. **URODELA,** including the salamander, triton, &c.
ORDER 3. **AMPHIPNEUSTA,** including the syren, axolotl, proteus, &c.
ORDER 4. **APODA,** including the cœcilia.
ORDER 5. **LEPIDOTA,** including the lepidosiren paradoxura.

Class V. PISCES, Fishes: divided into five Orders, as follows:

ORDER 1. **SELACHIA,** including the thornback, torpedo, ray, sting-ray, saw-fish, and sharks, as the hammer-head, thrasher, dog-fish, sea-cat, &c.
ORDER 2. **GANOIDEA,** including the sturgeon, bony pike, amia, beluga, &c.
ORDER 3. **TELEOSTIA,** including several sub-orders and a great variety of species, as the balistes, sun-fish, trunk-fish, sea-horse, fishing-frog, blenny, sea-wolf, sucking-fish, climbing-perch, mullet, sword-fish, pilot-fish, tunny, mackerel, John Doree, blepharis, chætodon, pagrus, perch, stickle-back, sea-snipe, bullhead, gurnard, wrasse, garfish, flounder, turbot, sole, halibut, plaice, haddock, whiting, ling, cod, roach, dace, chub, bleak, barbel, carp, pike, trout, salmon, shad, bass, tautog, white-fish, sheep's-head, weak-fish, blue-fish, alewife, grayling, char, smelt, pilchard, anchovy, sardine, sprat, herring, white-bait, electric eel, common eel, and many others.
ORDER 4. **CYCLOSTOMATA,** including the lampreys.
ORDER 5. **LEPTOCARDIA,** including the amphioxus lanceolatus.

Division II. MOLLUSCA:

From the Latin, signifying a soft-shell nut, and including animals with soft bodies: comprised in seven Classes and various Orders, as follows:

Class I. CEPHALOPODA: divided into two Orders:

ORDER 1. **DIBRANCHIATA,** including the cuttle-fish or sepia, squid, poulpe, &c.
ORDER 2. **TETRABRANCHIATA,** including the nautilus.

Class II. GASTEROPODA: divided into three Orders:

ORDER 1. **PULMONIFERA,** including the slug and snails.
ORDER 2. **BRANCHIFERA,** including the cowry, cypræa, scorpion-shell, periwinkle, limpet, elephant's tooth, doris, æolis, umbrella-shell, bubble-shell, &c.
ORDER 3. **HETEROPODA,** including the sagitta, firola, carinaria, &c.

Class III. PTEROPODA: divided into two Orders:

ORDER 1. **THECOSOMATA,** including the hyalea, &c.
ORDER 2. **GYMNOSOMATA,** including the clio australis, &c.

Class IV. PALLIOBRANCHIATA: comprising one Order, which contains the lingula anatina.

Class V. LAMELLIBRANCHIATA: divided into two Orders:

ORDER 1. **SIPHONATA**, including the cockle, clam, &c.
ORDER 2. **ASIPHONATA**, including the mussel, pearl-oyster, scallop, oyster, &c.

Class VI. TUNICATA: divided into two Orders:

ORDER 1. **BIPHORA**, including the salpa.
ORDER 2. **ASCIDIA**, including the pyrosoma.

Class VII. BRYOZOA: divided into two Orders:

ORDER 1. **LOPHOPODA**, including the crystatella.
ORDER 2. **INFUNDIBULATA**, including the sea-mats.

Division III. ARTICULATA.

Arranged in eight Classes and various Orders, as follows:

Class I. INSECTA, or Insects: divided into thirteen Orders, as follows:

ORDER 1. **COLEOPTERA**, including the cock-chaffer, beetles, wire-worm, fire-fly, glow-worm, scarabæus, blister-fly, diamond beetle, church-yard beetle, corn-weevil, nut-weevil, turnip-fly, lady-bird, puff-ball beetle, &c.
ORDER 2. **STREPSIPTERA**, bee-parasites.
ORDER 3. **HYMENOPTERA**, including bees, wasps, hornets, ants, ichneumon-fly, gall-fly, saw-fly, &c.
ORDER 4. **LEPIDOPTERA**, butterflies, moths, silk-worms, caterpillars, &c.
ORDER 5. **DIPTERA**, two-winged flies, house-flies, forest-flies, daddy-long-legs, Hessian-fly, gnat, mosquito, &c.
ORDER 6. **APHANIPTERA**, fleas.
ORDER 7. **NEUROPTERA**, including the snake-fly, scorpion-fly, ant-lion, dragon-fly, ephemera or May-fly, stone-fly, death-watch, termites or white ants, &c.
ORDER 8. **ORTHOPTERA**, including the cock-roach, ear-wig, the mantis or walking-leaf, the walking-stick, cricket, and locust.
ORDER 9. **PHYSOPODA**, including the thrips cerealium.
ORDER 10. **RHYNCHOTA**, including the bed-bug, boat-fly, cicada, hop-fly, lantern-flies, aphides or plant-lice, cochineal-insect, &c.
ORDER 11. **THYSANURA**, including the machilis, spring-tails, &c.
ORDER 12. **MALLOPHAGA**, insects resembling lice.
ORDER 13. **ANOPLURA**, louse.

Class II. MYRIOPODA, Centipedes: including two Orders:

ORDER 1. **CHILOGNATHA**, including the true centipede.
ORDER 2. **CHILOPODA**, including the scolopendra.

Class III. ARACHNIDA: including five Orders, as follows

ORDER 1. **DIMEROSOMATA**, including spiders of various kinds.
ORDER 2. **POLYMEROSOMATA**, including scorpions.
ORDER 3. **ADELARTHROSOMATA**, including the harvest-spider, &c.
ORDER 4. **ACARINA**, or Monomerosomata, including the dog-louse or harvest-bug, cheese-mite, itch-mite, &c.
ORDER 5. **PODOSOMATA**, fish-parasite.

Class IV. CRUSTACEA: divided into eleven Orders, as follows:

ORDER 1. **DECAPODA,** including the crab, pea-crab, calling-crab, hermit-crab, shrimp, prawn, cray-fish, lobster, &c.
ORDER 2. **STOMAPODA,** including the squilla, opossum-shrimp, &c.
ORDER 3. **ISOPODA,** including the wood-louse.
ORDER 4. **AMPHIPODA,** including the sand-hopper.
ORDER 5. **LÆMODIPODA,** including the whale-louse.
ORDER 6. **XYPHOSURA,** including the limuli, or king-crabs.
ORDER 7. **PHYLLOPODA,** including the apus, trilobites, &c.
ORDER 8. **OSTRACODA,** including the cypris.
ORDER 9. **COPEPODA,** including the cyclops.
ORDER 10. **PARASITA,** including the argulidæ, &c.
ORDER 11. **CIRRHOPODA,** including barnacles and sea-acorns.

Class V. ROTIFERA: divided into two Orders, as follows:

ORDER 1. **NATANTIA,** including the polytrocha, &c.
ORDER 2. **SESSILIA,** including the flosculariadæ.

Class VI. ANNELIDA: divided into four Orders, as follows:

ORDER 1. **ERRANTIA,** including the sea-mice, lob-worm, peripatus, nereis, &c.
ORDER 2. **TUBICOLA,** including the terebella, serpulæ, &c.
ORDER 3. **SCOLECINA,** including the earth-worms.
ORDER 4. **SUCTORIA,** including the leech.

Class VII. NEMATELMIA: divided into three Orders, as follows:

ORDER 1. **NEMATOIDEA,** including the thread-worm, Guinea-worm, &c.
ORDER 2. **GORDIACEA,** including hair-worms.
ORDER 3. **ACANTHOCEPHALA,** including parasitic worms.

Class VIII. PLATYELMIA: divided into three Orders, as follows:

ORDER 1. **PLANARIDA,** including the ribbon-worm.
ORDER 2. **TREMATODA,** including the fluke.
ORDER 3. **CESTOIDEA,** including the tape-worm.

Division IV. RADIATA.

Divided into five Classes and various Orders, as follows:

Class I. ECHINODERMATA: divided into four Orders, as follows:

ORDER 1. **HOLOTHURIDA,** including the sea-cucumber.
ORDER 2. **ECHINIDA,** including the sea-eggs, sea-urchin, &c.
ORDER 3. **STELLERIDA,** including the gorgon's head and star-fishes.
ORDER 4. **CRINOIDEA,** including the hair-stars, sea-lilies, &c.

Class II. SIPHONOPHORA: divided into two Orders, as follows:

ORDER 1. **PHYSOGRADA,** including the Portuguese man-of-war.
ORDER 2. **CHONDROGRADA,** including the velella.

Class III. CTENOPHORA: comprising one Order, and including the cestum veneris, and cydippe or beroë.

Class IV. DISCOPHORA: divided into two Orders, as follows:

ORDER 1. **STEGANOPHTHALMATA,** including various kinds of covered-eyed medusæ, called jelly-fishes, sea-nettles, sea-blubbers, acalephæ, &c.

ORDER 2. **GYMNOPHTHALMATA,** including various kinds of naked-eyed medusæ.

Class V. POLYPI: divided into three Orders:

ORDER 1. **HELIANTHOIDA,** including the actiniæ, sea-anemones, sea-carnations, or sea-flowers; also madrepores, or tree-corals, cup-corals, brain-corals, &c.

ORDER 2. **ASTEROIDA,** including various kinds of zoophytes, called asteroid-polypes, or corallines; as the cock's-comb, sea-pen, sea-feather, sea-fan, dead-man's-toes, dead-man's-fingers, &c.

ORDER 3. **HYDROIDA,** including various kinds of branched and jointed zoophytes, as the halecium, sertularia, sea-bristles, sea-fir, &c.; also the hydra, &c.

Division V. PROTOZOA.

Divided into three Classes and various Orders, as follows:

Class I. INFUSORIA: divided into two Orders:

ORDER 1. **STOMATODA,** including the vorticella, or bell-animalcules.

ORDER 2. **ASTOMATA,** including the mouthless infusoria.

Class II. PORIFERA: including the sponges.

Class III. RHIZOPODA: divided into two Orders.

ORDER 1. **POLYTHALAMIA,** including the associated proteus.

ORDER 2. **MONOSOMATA,** including the solitary proteus, as the arcella, amœba, &c.*

OF SPECIES BELONGING TO THE ANIMAL KINGDOM.

The preceding Classification embraces the entire animal kingdom, exclusive of fossil remains. The number of species belonging to this has been estimated as follows: Mammalia, 2,000; Birds, 6,000; Reptiles, 2,000; Fishes, 10,000; Mollusca, 15,000; Articulata, 200,000; Radiata, 10,000: making 245,000 in all.

It is supposed the fossil species may be equal in number to these, making nearly half a million. It is highly probable the actual number of species in the animal kingdom is even beyond this. All these, however, are not yet actually known. About a century ago, the whole number of ascertained species did not exceed 8,000; but such have been the earnestness and activity of research, that 60,000 species have now been made out and described. Specimens of about 1,500 mammalia, 5,000 birds, 1,500 reptiles, 6,000 fishes, 10,000 mollusca, and 50,000 insects and other articulata are in the various collections and museums of Europe.

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* It is proper to state that in preparing this Classification, and in various parts of the preceding Introduction, we have been largely indebted to the excellent Natural History of W. S. Dallas, London, 1856.



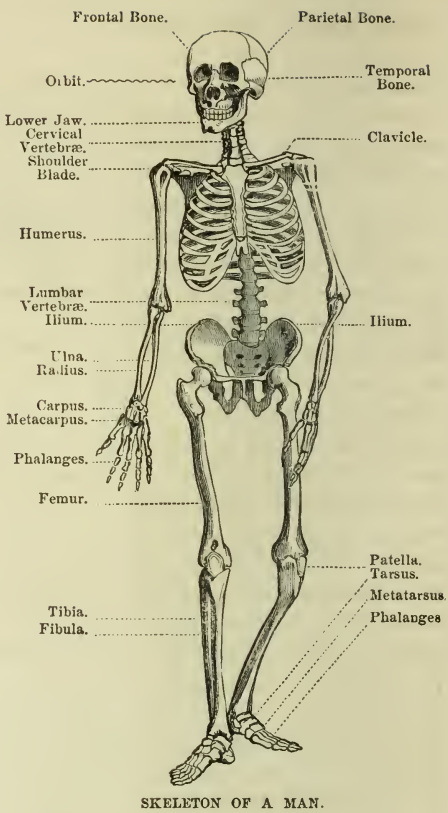
Division I. VERTEBRATA.

This division of the Animal Kingdom, including the five important classes of Mammalia, Birds, Reptiles, Amphibia, and Fishes, is denominated Vertebrata, all the species having a vertebrated column, called the backbone, constituting the basis of the entire skeleton. They are distinguished for having the nervous matter, the instrument of all intelligence, concentrated in a single mass, which may, however, be considered as consisting of two parts—viz., the *spinal marrow*, running through the length of the body, and a greatly enlarged mass in the head, called the *brain*. To protect this most delicate and precious substance from external violence, it is incased in a strong bony covering. That part which defends the spinal marrow consists of a number of perforated bones, called vertebræ, joined to each other by cartilage, so as to make a continuous tube; while the casing of the brain consists of a box, more or less globular, called the *skull*.

Through orifices at various points in these bones, ramifications of nervous matter proceed to all parts of the body, these being the medium of sensation. The organs of the higher senses, as sight, hearing, taste, and smelling, are situated in the immediate vicinity of the brain: the organs of the sense of touch are usually distributed over the surface of the body, being more particularly active, however, in certain parts of the skin.

For voluntary change of situation, or power of motion, most animals of this division are furnished with limbs, usually four in number, and ranged in pairs on the two sides. These, however, vary in form and function in the different classes. In man, the limbs consist of two legs and two arms, the latter terminated by hands; in the monkey tribes, the arrangement is similar, but all the four limbs are used for progression. In the bats, the arms and fingers are prolonged into wings. In the cetacea, the limbs are used for swimming only; in the seal tribe, for swimming chiefly, though they also serve for moving on the land in an awkward manner. In quadrupeds, the four limbs are legs only; in birds, there are two legs and two wings. In serpents, the limbs are wanting. In fishes, the limbs consist of fins. It will be observed that in all these species, without exception, this vertebral column, or backbone, is present, though in a few cases among the lower members of the division, as the skate, for instance, it becomes cartilaginous, and in a few others it is membraneous. In many species it is prolonged into a tail, which frequently seems only an ornament, while in most cases it is useful, especially among climbing quadrupeds, as a balance-pole in running along the limbs of trees, or as a hand to lay hold of them in swinging

from one branch to another. Among swimming animals, the tail is both rudder and oar. With these exceptions and modifications, it will be remarked that the framework of the numerous races belonging to this division are still formed on one general plan, denoting a striking unity of design. That this unity should be combined with such infinite variety, is calculated to exalt our ideas of the amazing resources of the Creative Mind.



SKELETON OF A MAN.

In the members of this division food is received, and in some degree prepared for digestion, by the action of the jaws, the lower of which opens perpendicularly. In general, these are armed with bony projections, called teeth, which cut or grind the food. These are of great importance, not only in the economy of animals, but they are an essential guide in classification. The cutting teeth, called *incisors*, occupy the front of the mouth: the *canines*, or carnivorous teeth, are conical, four in number, two on each side of the mouth. The *molars*, or grinding teeth, are set back in the jaw, and are extremely various in form. They are very important, however, in indicating the habits and internal structure of animals. It is said that Cuvier could instantly determine the character of any animal—its habits, food, structure of the stomach, form of the limbs—of which he could be furnished a set of the teeth. In this way the nature of many fossil animals has been determined. In general, it may be said that the molars of flesh-eating animals are pointed or conical at the summit, while those of ruminants and rodents are more flat and even. In man, we find examples of all these kinds of teeth: in some animals, as the ox and horse, the canines are entirely wanting. While some classes of vertebrata are thus furnished with teeth, they are not found in others, birds and tortoises having their jaws incased in a horny beak. The food received into the body of the animals we are describing passes from the mouth through a tube into a sac, called the *stomach*, where it undergoes certain chemical changes, and receives various secretions from the body. It then enters into a lengthened membraneous tube called the intestine, the sides of which are studded with innumerable little vessels, by which the nutritious portion of the food is taken up and conveyed into the veins to form blood, the useless portion being rejected.

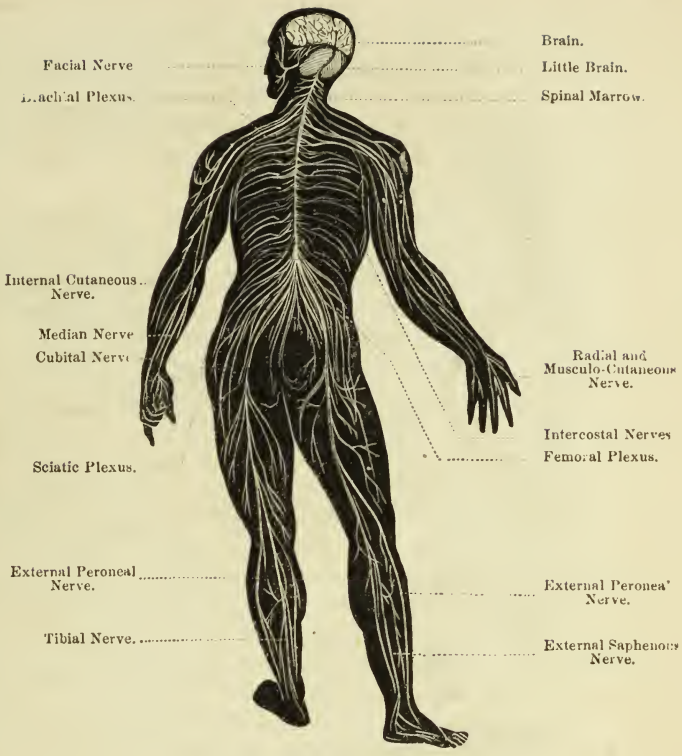
Before the supply of nutritious matter which we have just seen poured into the veins can be made available for the support of the body, it must undergo some important changes. These are effected by the admixture of oxygen, derived generally from the atmosphere; but in the case of fishes, from the water. To understand in what manner this admixture takes place, we must glance a moment at the *circulatory system*. All the animals of this division are copiously supplied with a fluid essential to their existence, called *blood*, from which it is believed all other parts of the body, even the most solid, are originally formed, and by which they are increased and supported. This fluid ceaselessly circulates through two series of vessels, ramifying with inconceivable minuteness to every part of the animal. In the one set, called *veins*, receiving the blood after it has performed its renovating office, we have said that it mixes with foreign matter from the digested food; thus supplied, it is carried to the *heart*, a large hollow muscle, which alternately contracts and expands without intermission, by which motions it is received and thrown forward in regular pulsations.

Hence, in whole or in part, it is carried, in those animals which breathe air, to the *lungs*—a

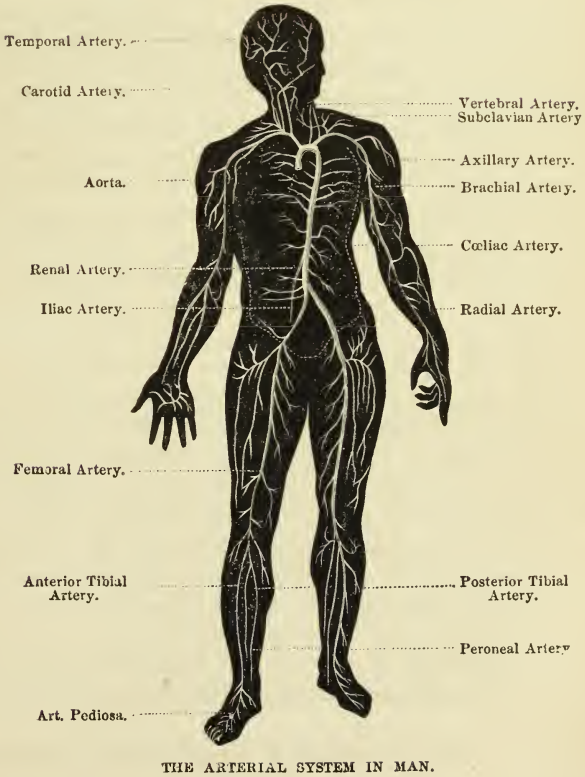
spongy mass of minute cells communicating with the external air. Over the surface of these cells the blood-vessels ramify, and their coats become so thin as to admit the union of the oxygen with the contained blood, the result of which is an instant change of its color from dark red to vivid scarlet. The *gills* of fishes perform the same office as the lungs, water being used instead of air. The blood thus renewed is returned by being carried to another chamber of the heart, whence it is ejected into the other set of vessels, called *arteries*, which, large at first, but branching into innumerable ramifications, convey it to every part, and at last, in a manner not thoroughly understood, transfer it into the extremities of the veins, which, as we have seen, carry it back to be renewed again. This is what is meant by the well-known expression, *the circulation of the blood*, and which is carried on not only in man, but in all the other vertebrata.

The young are produced in all cases from ova, or eggs, which exist in the body of the female. In most cases, the young animal is excluded from the egg while it is within the body of the mother; in others the egg itself is produced, and the young hatched some time afterward. The animals of the former class are called *viviparous*; of the latter, *oviparous*.

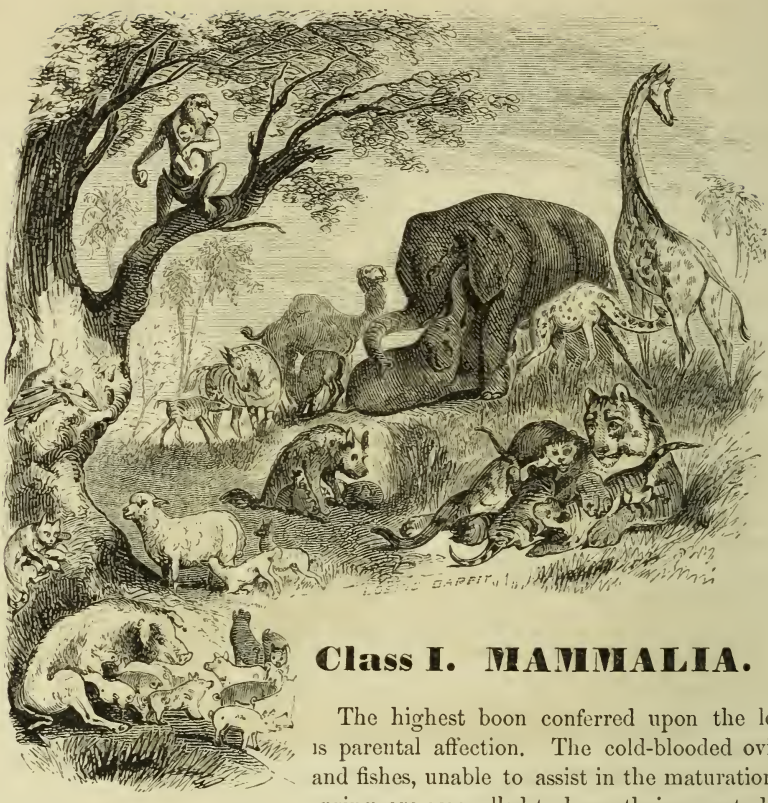
A curious and remarkable departure from both of these systems is found in the *marsupialia*, as the opossum, kangaroo, and others, which have a pouch under the belly, into which the young, born in an immature state, are received and nursed till they are able to take care of themselves.



THE NERVOUS SYSTEM IN MAN.



THE ARTERIAL SYSTEM IN MAN.



Class I. MAMMALIA.

The highest boon conferred upon the lower animals is parental affection. The cold-blooded ovipara, reptiles and fishes, unable to assist in the maturation of their offspring, are compelled to leave their eggs to be hatched by the agency of external circumstances, and their progeny, even from the moment of their birth, are usually abandoned to chance and their own resources for protection and nourishment. In birds, the duties and the pleasures inseparable from the necessity of incubating their ova, and of providing nutriment for their callow brood, are indeed manifested to an extent altogether unparalleled in the lower order of vertebrate animals; but it is to the mammals alone, the most sagacious and intelligent of all the inhabitants of the earth, that the Creator has permitted the full enjoyment of paternal and maternal love. It is in respect to these alone that he has cast the offspring absolutely helpless and dependent on a mother's care and solicitude, thus conferring upon the parent the joys and comforts that a mother only knows, the dearest, purest. and sweetest bestowed upon the animal creation.*

The grand circumstance, therefore, by which this class of beings, designated under the title of *Mammalia*, may be distinguished from all other members of the animal kingdom is, that the females of every species are furnished with *mammary glands*—organs designed to supply a secretion called *milk*, whereby the young are nourished from the moment of their birth, until they have reached a sufficient age to enable them to live upon such animal or vegetable food as may be adapted to their mature condition. The possession of these lactiferous glands is the great and decisive characteristic of the class; to this, however, it may be added, that their visceral cavity is separated into a thorax and abdomen by a muscular diaphragm, and that they breathe by means of lungs similar to our own. Of their internal structure, we shall give a more detailed example when we come to describe the human specie

The mammalia are very widely distributed over the earth. Most of them are terrestrial in their habits, either browsing the herbage from the ground, or, if carnivorous, leading a life of rapine, by carrying on an incessant and destructive warfare against animals inferior to themselves in strength

* Jones's "Structure of the Animal Kingdom."

and ferocity. Many inhabit the trees; some burrow beneath the soil; a few raise themselves into the air, and flit about in search of their insect prey. The otter and the seal persecute the fishes in their own element, while the gigantic whale wallows upon the surface of the sea, or plunges into its fathomless depths. With such diversity of habits, we might expect great variety in their structure; and this will be fully realized in the ensuing description of the various species.



THE SUPREMACY OF MAN OVER THE ANIMAL CREATION.

ORDER 1. **BIMANA.**

Genus HOMO: Species MAN: *Homo sapiens.*—Man is regarded by naturalists as constituting the *Genus* HOMO, he being its sole representative. The various tribes and races of mankind are embraced in one species, *Homo sapiens:* that is, *man endowed with reason.* His zoological characteristics, as given by Blumenbach, are as follows: "Erect; two-handed; unarmed; rational; endowed with speech; a prominent chin; four incisor teeth above and below; all the teeth equally approximated; the canine teeth of the same length as the others; the lower incisors erect." He is the highest being in the animal series. That he was made to be the lord of creation is alike evident from physiology, revelation, and history: he has mastered the horse, the whale, the ox, the lion, and the tiger—either subjecting them to his use, or sweeping them from his path.

PECULIAR CONFORMATION OF MAN.

Attempts have been made to assimilate man in his structure to some of the mammalia, and especially the apes, but a careful examination proves him to be essentially different.

The foot of man is very different from that of apes: it is large, the leg bears vertically upon it; the heel is expanded beneath; his toes are short, and but slightly flexible; the great toe, longer and larger than the rest, is placed on the same line with and cannot be opposed to them. This foot, then, is proper for supporting the body, but cannot be used for seizing or climbing; and as the hands are unfitted for walking, man is the only animal truly *bimanous* and *biped.*

The whole body of man is modified for the vertical position. His feet, as we have already seen, furnish him with a larger base than those of other mammalia; the muscles which retain the foot and thigh in the state of extension are more vigorous, whence results the swelling of the calf and the part above the thigh; the flexors of the leg are attached higher up, which permits of complete extension of the knee, and renders the calf more apparent. The pelvis is larger, which

separates the thighs and feet, and gives to the trunk that pyramidal form favorable to equilibrium: the necks of the thigh-bones form an angle with the body of the bone, which increases still more the separation of the feet, and augments the basis of the body. Finally, the head, in this vertical position, is in equilibrium with the trunk, because its articulation is exactly under the middle of its mass.

Were he to desire it, man could not, with convenience, walk on all-fours: his short and nearly inflexible foot, and his long thigh, would bring the knee to the ground; his widely separated shoulders and his arms, too far extended from the median line, would ill support the fore-part of his body. The great indented muscle which, in quadrupeds, suspends the trunk between the blade-bones as a girth, is smaller in man than in any one among them: the head is heavier, on account of the magnitude of the brain, and the smallness of the sinuses or cavities of the bones; and yet the means of supporting it are weaker, for he has neither cervical ligament, nor are the vertebræ so modified as to prevent their flexure forward; he could therefore only maintain his head in the same line with the spine, and then, his eyes and mouth being directed toward the ground, he could not see before him: the position of these organs is, on the contrary, quite perfect, supposing that he walks erectly.

The arteries which supply his brain not being subdivided as in many quadrupeds, and the blood requisite for so voluminous an organ being carried to it with too much violence, frequently apoplexies would be the consequence of a horizontal position.

Man, then, is designed to be supported by the feet only. He thus preserves the entire use of his hands for the arts, while his organs of sense are most favorably situated for observation.

These hands, which derive such advantages from their liberty, receive as many more from their structure. Their thumb, longer in proportion than in the apes, increases the facility of seizing small objects; all the fingers, except the annularis, and this to a certain extent, have separate movements, which is not the case in any other animal, not even in the apes. The nails, covering only one side of the extremities of the fingers, form a support to the touch, without in the least depriving it of its delicacy. The arms which support these hands have a solid attachment by their large blade-bone, their strong collar-bone, &c.

Man, so highly favored as to dexterity, is not so with regard to strength. His swiftness in running is much inferior to that of other animals of his size: having neither projecting jaws, nor salient canine teeth, nor crooked nails, he is destitute of offensive armature; and the sides and upper part of his body being naked, unprovided even with hair, he is absolutely without defensive weapons; lastly, he is of all animals that which is latest to acquire the power necessary to provide for himself.

But this weakness even has been for him another advantage, in obliging him to have recourse to his internal resources—to that intelligence which has been awarded to him in so high a degree; a fact which sufficiently proves that man's intellect was designed by nature to be the great instrument of his power.

No quadruped approaches him in the magnitude and convolutions of the hemispheres of the brain, that is to say, of that part of this organ which is the principal instrument of the intellectual operations: the posterior portion of the same organ extends backward, so as to form a second covering to the cerebellum: even the form of the cranium announces this great size of the brain, as the smallness of the face shows how slightly that portion of the nervous system which influences the external senses predominates in him.

These external senses, however, moderate as they all are in man, are yet extremely delicate and well balanced.

His two eyes are directed forward: he does not see on two sides at once, like many quadrupeds; which produces more unity in the result of his vision, and concentrates his attention more closely on objects of this kind. The ball and iris of his eye vary but little, which restrains the activity of his sight to limited distances, and to a determined degree of light. The conch of his ear, possessing but little mobility or extent, does not increase the intensity of sounds: notwithstanding which, of all animals, he best distinguishes their intonation. His nostrils, more complicated than those of apes, are less so than those of all other genera; and yet he appears to be the

only animal whose sense of smell is sufficiently delicate to be offended by unpleasant odors. Delicacy of smell must influence that of taste; and man must have a further advantage, in this respect, at least over those animals whose tongues are covered with scales. Lastly, the nicety of his touch results both from the delicacy of his teguments and the absence of all insensible parts, as well as from the form of his hand, which is better adapted than that of any other animal for suiting itself to the small inequalities of surfaces.

Man has a particular pre-eminence in his organ of voice: of all mammalians, he can alone articulate sounds; the form of his mouth and the great mobility of his lips being probably the cause of this. Hence results his most invaluable mode of communication; for of all the signs which can be conveniently employed for the transmission of ideas, variations of sound are those which can be perceived at the greatest distance, and in the most various directions, simultaneously.

It seems that even the position of the heart and of the great vessels bears reference to the vertical carriage. The heart is placed obliquely on the diaphragm, and its point inclines to the left, thereby occasioning a distribution of the aorta differing from that of most quadrupeds.

The natural food of man, judging from his structure, appears to consist principally of the fruits, roots, and other succulent parts of vegetables. His hands afford every facility for gathering them; his short and but moderately strong jaws on the one hand, and his canines being equal only in length to the other teeth, together with his tuberculated molars on the other, would scarcely permit him either to masticate herbage or to devour flesh, were these articles not previously prepared by cooking. Once, however, possessed of fire, and those arts by which he is aided in seizing animals or killing them at a distance, every living being was rendered subservient to his nourishment, thereby giving him the means of an indefinite multiplication of his species.

His organs of digestion are in conformity with those of manducation: his stomach is simple; his intestinal canal of mean length; his great intestines well marked; his cæcum short and thick, and augmented by a small appendage; and his liver divided only into two lobes and one small one.

To complete this abridged statement of the anatomical structure of man, necessary for this Introduction, we will add that he has thirty-two vertebræ, of which seven belong to the neck, twelve to the back, five to the loins, five to the sacrum, and three to the coccyx. Of his ribs, seven pairs are united to the sternum by elongated cartilages, and are called true ribs; the five following pairs are denominated false ones. His adult cranium consists of eight bones: an occipital; two temporal; two parietal; a frontal; an ethmoidal, and a sphenoidal. The bones of his face are fourteen in number: namely, two maxillaries; two jugals, each of which joins the temporal to the maxillary bone of its own side by a sort of handle named the zygomatic arch; two nasal bones; two palatines, behind the palate; a vomer, between the nostrils; two turbinated bones of the nose in the nostrils; two lachrymals in the inner angles of the orbits, and the single bone of the lower jaw. Each jaw has sixteen teeth: four cutting incisors in the middle, two pointed canines at the corners, and ten molars with tuberculated crowns, five on each side—in all, thirty-two teeth. His blade-bone has at the extremity of its spine or projecting ridge a tuberosity, named the acromion, to which the clavicle or collar-bone is connected, and over its articulation is a point termed the coracoid process, to which certain muscles are attached. The radius turns completely on the cubitus or ulna, owing to the mode of its articulation with the humerus. The wrist has eight bones, four in each range; the tarsus has seven; those of the remaining parts of the hand and foot may be easily counted by the number of digits. (See figure, p. 32.)

PHYSICAL AND MORAL DEVELOPMENT OF MAN.

The ordinary produce of the human species is but one child at a birth; for in five hundred cases of parturition, there is only one of twins, and more than that number is extremely rare. The period of gestation is nine months. A fœtus of one month is ordinarily an inch in height; at two months, it is two inches and a quarter; at three months, five inches; at five months, six or seven inches; at seven months, eleven inches; and at nine months, eighteen inches. Those which are born prior to the seventh month usually die. The first or milk teeth begin to appear a few months after birth, commencing with the incisors. The number increases in two years to twenty, which are shed successively from about the seventh year, to be replaced by others. Of

the twelve posterior molars, which are permanent, there are four which make their appearance at four years and a half, four at nine years; the last four being frequently not cut until the twentieth year.

The fœtus grows more rapidly in proportion as it approaches the time of birth. The infant, on the contrary, increases always more and more slowly. It has upward of a fourth of its height when born, attains the half of it at two years and a half, and the three-fourths at nine or ten years. By the eighteenth year the growth almost entirely ceases. Man rarely exceeds six feet, and seldom remains under five. Woman is ordinarily some inches shorter.

Scarcely has the body attained its full growth in height before it commences to increase in bulk; fat accumulates in the cellular tissue. The different vessels become gradually obstructed; the solids become rigid; and after a life more or less prolonged—more or less agitated—more or less painful—old age arrives, with decrepitude, decay, and death. Man rarely lives beyond a hundred years; and most of the species, either from disease, accidents, or merely old age, perish long before that term.

The child needs the assistance of its mother much longer than her milk, whence results an education intellectual as well as physical, and a durable mutual attachment. The nearly equal number of individuals of the two sexes, the difficulty of supporting more than one wife, when wealth does not supply the want of power, intimate that monogamy is the natural condition of our species; and as, wherever this kind of union exists, the sire participates in the education of his offspring, the length of time required for that education allows the birth of others, whence the natural perpetuity of the conjugal state. From the long period of infantile weakness results domestic subordination, and, consequently, the order of society at large, as the young persons which compose the new families continue to preserve with their parents those tender relations to which they have so long been accustomed. This disposition to mutual assistance multiplies to an almost unlimited extent those advantages previously derived by isolated man from his intelligence; it has assisted him to tame or repulse other animals, to defend himself from the effects of climate, and thus enabled him to cover the earth with his species.

In other respects, man appears to possess nothing resembling instinct—no regular habit of industry produced by innate ideas; all his knowledge is the result of his sensations, his observations, or of those of his predecessors. Transmitted by speech, increased by meditation, applied to his necessities and his enjoyments, they have given rise to all the arts. Language and letters, by preserving acquired knowledge, are a source of indefinite perfection to his species. It is thus that he has acquired ideas, and made all nature contribute to his wants.*

STRIKING CHARACTERISTICS OF THE HUMAN RACE.

It is a remarkable fact, and worthy of particular notice, that in the economy of his body man is endowed with the ability to live on almost any part of the globe, and of thriving alike in either extreme of natural temperature. Thus the Greenlanders and Esquimaux have reached between 70° and 80° N. latitude, while the negro of Africa and the red man of America live under the equator. But even Europeans, accustomed to a temperate climate, can bear either of these extremes of cold and heat, as has been sufficiently proved by the numerous instances in which those who have gone on the Arctic expeditions have been obliged to winter in high northern latitudes; and, on the other hand, by the slight degree in which European settlers in the hottest parts of Africa are influenced by the temperature.

Man subsists with equal facility under various degrees of atmospheric pressure—as well in the deepest valleys as upon the most elevated table-lands. In correspondence with his ability to inhabit every zone, he is able to subsist on the most varied food. In these respects he stands alone. But however widely he may be distinguished from other animals in the peculiarities of his structure and economy, yet the sentiments, feelings, sympathies, internal consciousness, and mind, and the habitudes of life and action thence resulting, are the real and essential characteristics of humanity. The difference in these respects between man and all other animals is indeed so great

* Cuvier's "Animal Kingdom."

that a comparison is scarcely possible. The highest moral endowments of animals are shown in their attachment to their offspring; but this ceases when the period of helplessness is past, and there is no evidence of attachment between individuals, except in the associated labors of some species, and the consentaneous actions of the male and female for the safety of the offspring. The arts of which animals are capable are limited, and peculiar to each species; and there seems to be no evidence of a power of invention, or of construction for any purpose beyond that to which the original and instinctive powers are adapted. What is the vaunted village of the beaver, the most ingenious of quadrupeds, in comparison with a human city, with its ships and merchandise, its temples, churches, and dwellings, its libraries, and its monuments of art!

In intimate connection with his exalted mental endowments is man's peculiar possession of language, already alluded to, the immense results of which, in the accumulating, recording, and distributing of knowledge, it is scarcely possible to conceive. Other animals are naturally speechless, not from any material difference in the structure of their organs—for man can teach some of them to imitate him—but from their inability to form those associations of ideas which are essential to the construction and utterance of words.



Among the monkeys, the adults exercise authority over the young, and it is said maintain it even by chastisement; but there is no instance in which the stronger species has exercised authority over the weaker, or brought it into a state of servitude. Even when made the associates of man, and instructed by him, how little have animals learned!—a few unmeaning tricks, unwillingly performed, a few words uttered and constantly repeated, without choice or a conception of their meaning, and sullen passive submission, are in general the best results that can be found. There is not a proof in the whole history of animals that any species or individual has ever made an advance toward an improvement, or an alteration in its condition. Whether solitary or living in herds, the habits of all remain the same; all of the same species appear endowed with the same faculties and dispositions, and each is in mental power the same throughout its life.

Contrast with these the progress of man. In his origin weak, naked, and defenceless, he has not only obtained dominion over all the animate creation, but the very elements are made to serve his purpose. Of the earth he has built his houses, and constructed weapons and the implements of art; he uses the wind to carry him in ships and to prepare his food; and when the wind will not suit him, he employs fire and water to replace or to resist it. By artificial light he has prevented the inconveniences of darkness; he has stopped and made rivers, and has forced deserts, marshes, and forests alike to produce his food. He has marked out and measured the course of the celestial bodies, till he has discovered from them the size and form of the earth that he himself inhabits. And besides all this, man extends his views beyond this life. He knows and anticipates death, and instructed alike by the inductions of Reason and the teachings of a divine revelation, he, and he alone, aspires to Immortality.



NEGRO OF CONGO.



CÆSAR.

THE UNITY OF THE HUMAN RACE.

While thus the immense difference between man and all other animals is manifest, another question of great interest arises, and that is as to the specific unity of the various races of which the great human family is composed. This has been put by an eloquent writer in the following form:

"Does the Bosjesman, who lives in holes and caves, and devours ants' eggs, locusts, and snakes, belong to the same species as the men who luxuriated in the hanging gardens of Babylon—or walked the olive-grove of Academe—or sat enthroned in the imperial homes of the Cæsars—or reposed in the marble palaces of the Adriatic—or held sumptuous festivals in the gay salons of Versailles? Can the groveling Wawa, prostrate before his fetish, claim a community of origin with those whose religious sentiments inspired them to pile the prodigious temples of Thebes and Memphis—to carve the friezes of the Parthenon—or to raise the heaven-pointed arches of Cologne? That ignorant Ibo, muttering his all but inarticulate prayer—is he of the same ultimate ancestry as those who sang deathless strains in honor of Olympian Jove or of Pallas Athenè—or of those who, in a purer worship, are chanting their glorious hymns or solemn litanies in the churches of Christendom?

"That Alfouro woman, with her flattened face, transverse nostrils, thick lips, wide mouth, projecting teeth, eyes half-closed by the loose swollen upper eyelids, ears circular, pendulous, and flapping, the hue of her skin of a smoky black, and—by way of ornament!—the septum of her nose pierced with a round stick some inches long—is she of the same original parentage as those whose transcendent and perilous beauty brought unnumbered woes on the people of ancient story, convulsed kingdoms, entranced poets, and made scholars and sages forget their wisdom? Did they all spring from one common mother?

"Were Helen of Greece, and Cleopatra of Egypt, and Joanna of Aragon, and Rosamond of England, and Mary of Scotland, and the Eloises, and Lauras, and Ianthes—were all these, and our poor Alfouro, daughters of her who was fairer than any of them—Eve? The Quaigua, or Saboo, whose language is described as consisting of certain snapping, hissing, grunting sounds—all more or less nasal—is he too of the same descent as those whose eloquent voices 'fulmined over Greece,'



PAPUAN.



EUGENIE.

or shook the forum of Rome—or as that saint and father of the Church, surnamed the 'Golden-mouthed'—or as those whose accents have thrilled all hearts with indignation, or melted them with pity and ruth, in the time-honored halls of Westminster?"

It will be perceived that the argument implied in this interrogation is simply this: It is impossible that beings of such diverse characteristics—mental, moral, and physical—can be the offspring of the same parents; or, in other words, they cannot be of the same species, using the term in its scientific sense. The reply has been, in the first place, that these diversities are less radical than might appear from a superficial examination. Among all these different tribes, it is found that the deviations of size, form, complexion, and character are not much greater than are perceived between the acknowledged members of the same race. Among the dark races of hot climates, albinos, with a milk-white skin and silken hair of a yellow hue, are not uncommon. Light-complexioned children have often been born of the black-haired and swarthy Jews. There is abundant historical evidence of instances of this variety of complexion springing up among the Greeks, Romans, Assyrians, Laplanders, Tartars, and other families of the less swarthy type, as well as among the Negroes, Egyptians, and Malays.

There are some differences of structure observed in the different races of mankind; there is also great diversity in the texture of the skin and the character of the hair. It is, however, to be here observed, that in the same nations there are similar varieties, and this may be accounted for by the influence of situation and climate. If we turn for analogies to the animal tribes, we shall discover abundant evidence of the transforming influence of circumstances upon the physical and moral character of animals.

The races of swine present, for example, even more remarkable instances of variation, which have been particularly described by Blumenbach. It is certain that these have all descended from the wild-boar; and it is equally certain that swine were unknown in America till carried there by the Spaniards. Yet in that country they have already degenerated into breeds very different from each other and from their original. Those taken to Cubagua became a race with toes half a span long, and those of Cuba became more than twice as large as their progenitors. In Normandy, the swine are remarkable for the length of the bone of the hind-leg. Swine with solid hoofs were

known to the ancients, and large breeds of them are found in Hungary and Sweden. In some, also, the hoof is divided into five clefts. In Guinea, they have long ears couched upon the back; in China, a large pendent belly and very short legs; at Cape Verd and other places, very large curved tusks. Thus, then, in one species we find changes even greater than those which occur among men; and as to the most important, Blumenbach says that the whole difference between the cranium of the negro and that of a European is by no means greater than that which exists between the cranium of the wild-boar and that of the domestic swine. An examination of the different breeds of sheep, horses, oxen, goats, cats, rabbits, doves, and still more of the domestic fowl, would in like manner show that all these species, even while under observation, are subject to greater variations than are found in the different races of men. The various breeds of dogs are believed to have all descended from one parent stock; yet what greater diversity is there in the tribes of mankind than in these animals, from the robust and adventurous Newfoundland dog to the soft and silken lap-dog?

In respect of color, a perfect analogy holds between the varieties of domestic animals and those of men. In all those enumerated above, examples occur of the melanocomous, leucous, and xanthous varieties springing up casually or existing constantly in particular breeds. Thus even in England the cattle of different counties may be recognized by their color as well as by their forms. Azara remarks of the oxen and horses of Paraguay, where both species have run wild and multiplied very rapidly, that while all those that are domesticated vary considerably in color, those that are wild have all the same color;—the horses a chestnut or bay-brown; the oxen reddish-brown on the back, and black on the rest of the body.

This analogy between the variations to which domesticated, and more rarely wild animals, are subject, and those which are observed in men, is a strong argument for the unity of the human species. Another, which possesses much weight, is drawn from the propagation of the several races. It is well known that among all other animals, the hybrid productions of parents of different species are either quite barren, or so little prolific that they soon become extinct, and that an intermediate race cannot be maintained even to the second generation without a return to the pure blood of one or other parent. On the other hand, it is observed among domestic animals that the progeny of different varieties of the same species exceed in vigor, and are even more prolific than their parents; so that intermediate races are apt very soon to become more numerous than the originals from whence they sprung. It is asserted that exactly the same principle holds in the human race. All nations, it is said, propagate together with equal facility, and it is contended that the progeny of parents of different nations have in many instances exceeded those from whom they sprung in vigor and in the tendency to multiplication.

What may be the precise nature of the influences which have caused so much difference to exist between the individuals of the human race, we are unable to say; but instances are constantly occurring which seem to show us how possible it is that all the varieties of human beings have occurred in a common family. It is remarked by high English authority, that "even among the races of our own island, when exposed to circumstances which deprive them of their usual nutriment and means of developing the civilizing instincts of mankind, we find that they sink in character, and become physically degraded to a level with races whose features at first sight are very far removed. We need but to travel across the Irish Channel to see many groups of our Celtic fellow-subjects who have been reduced by famine and disease to a degraded condition closely bordering on that of these savages."

Although the color of the skin and the character of the hair give so very decided an appearance to many of the races of man, yet, as before remarked, there are on record a great number of cases in which individuals, with hair and skin of one color, have given birth to children with hair and skin of another color and character. Dr. Prichard mentions numerous instances of individuals with yellow hair and fair skin, among tribes with dark hair and skin; and in the temperate regions of Asia, whole tribes, evidently descended from dark-colored races, present the light color. The Jews appear to have been originally a dark-skinned and woolly-haired race; but it is well known that the Jews of Europe very frequently possess the characteristics of the lightest-colored races. On the other hand, we constantly see individuals born of white parents having woolly hair, a



THE CAUCASIAN MOTHER

dark skin, and other approaches to the black varieties of men. Even whole nations, as the Germans, for instance, have presented a tendency to become darker.

There is also evidence to prove that even the forms which the bones of the head assume among different nations is not fixed. Among the most highly developed races, having the most perfect forms of skull, we constantly see individuals with the projecting maxilla which is prevalent among the lowest tribes; while, on the other hand, individuals are often seen among the least civilized races presenting forms of the skull approaching those of the most cultivated nations. Facts such as these are constantly accumulating, and clearly point to the derivation of the human race from one pair.

While thus it appears that in the physical organization of mankind there are no fixed differences, or at least none in which the variation is greater than is shown to be the effect of climate and situation upon other races, it is still a striking fact that the same psychological nature prevails among all nations and tribes of the earth. However great may be the distance between the degrees of intellectual and moral elevation possessed by civilized and uncivilized nations, yet there is sufficient evidence to prove that in all there may be traced the same mental endowments, similar natural prejudices and impressions, the same consciousness, the same sentiments, sympathies, propensities,—in short, a common physical nature, or a common mind.

After an exceedingly careful survey of the various nations of the earth, Dr. Prichard remarks on this point with great force: "We contemplate among all the diversified tribes who are endowed with reason and speech, the same internal feelings, appetences, aversions; the same inward convictions; the same sentiments of subjection to invisible powers, and, more or less developed, of accountableness or responsibility to unseen avengers of wrong and agents of retributive justice, from whose tribunal men can not even by death escape."

This accordance in the physiological and psychical properties of all nations affords a powerful argument in favor of the whole human race being but one species; for, as Dr. Prichard observes, "the physiological characters of race are liable to few and unimportant variations;" and therefore when we find that in a great number of races spread over the surface of the globe no other differences occur, either in the average length of life, or the extreme length occasionally attained—in the periods of gestation, of infancy, of puberty, and of other changes in the economy, or in the habits, instincts, affections, and intellectual faculties—than may be fairly attributed to the differences of external circumstances, it may be safely concluded that they are all members of the same family, and the offspring of one common stock.

DIVERSITY OF ORIGIN IN THE HUMAN RACE.

We have thus given, very briefly, the argument chiefly derived from the learned and profound work of Prichard, in behalf of the unity of the human race. The conclusion, in harmony with the commonly received interpretation of the Mosaic record, which traces all mankind to one parentage, that of Adam and Eve, though it has been and still is the prevailing one, is not adopted by all naturalists of the present day. There are many philosophers of great eminence, and whose opinions are always entitled to respect, who maintain that mankind were created in pairs or in nations in different parts of the earth to which their descendants are constitutionally adapted, and to which they have an instinctive attachment.

The arguments to sustain this view, derived from history and various analogies with the vegetable and animal kingdoms, may be thus briefly stated: It is an undoubted fact that every geographical division of the globe has its peculiar vegetation. Even where there is a general resemblance, there are still specific differences. Thus, although we find in America and Europe, in the same parallels of latitude, trees which bear the same names—the oak, ash, chestnut, beech, maple, &c.—they are, for the most part, specifically different; and this is equally true of all other plants —very few instances being found in which indigenous vegetable products of one continent are identical with those of another.

While thus the vegetable world presents the remarkable fact of special kinds of trees and plants established by nature in particular localities, a similar arrangement appears to exist in regard to animals. Every considerable geographical district throughout the globe seems to have its pe-

culiar fauna, in some instances totally distinct from that of every other region of the earth. In the northern polar regions of both continents, we find the white bear, the rein-deer, the musk-ox, the walrus, and various species of seal; in Africa, we find the giraffe, zebra, chimpanzee, and hippopotamus; in Madagascar, the lemurs and the cheiromys; in Tartary, the yak and the musk-deer; in Southern Asia, the hippopotamus, the tiger, and the gibbon; in the great Asiatic islands, the orang-outang, the roussette-bat, and the cassowary; in Australia, the kangaroo, the ornithorhynchus, and the echidna; in North America, the grizzly bear, the bison, and the raccoon; in South America, the tapir, the lama, the sloth, the armadillo, and condor. These animals, which are but indications of large circles of fauna associated with them, are all peculiar species, apparently fixed by a controlling instinct in special localities, and hence are supposed to have originated in the places they inhabit.

In illustration of this subject—the geographical distribution and localization of animals—Milne Edwards says: "If a naturalist, familiar with the fauna of this country—France—visits distant regions, he sees, in proportion as he advances, the earth peopled with animals new to him, and these species next disappear in their turn to make room for other species, equally unknown to him. If, quitting France, he lands in South Africa, he will find but a very small number of animals similar to those he had seen in Europe, and he will observe, especially, the large-eared elephant; the hippopotamus; the double-horned rhinoceros; the giraffe; innumerable flocks of antelopes; the zebra; the Cape buffalo, whose horns cover by their large base all the forehead; the black-maned lion; the chimpanzee, which, of all animals, most resembles man; the cynocephalus, or dog-faced ape; peculiar species of vultures; a number of bright-plumed birds, strangers to Europe; insects equally different from those of the north—the fatal termites, for example, which live in numerous societies, and build of the soil habitations of considerable elevation and most singular construction.

"If our zoologist quits the Cape of Good Hope and penetrates into the large island of Madagascar, he will find a still different fauna. There he will no longer observe the large quadrupeds he found in Africa, and the family of the apes will be replaced by other mammals, equally well formed to climb trees, but more resembling the carnivora, and called by naturalists the *Makis:* he will meet with the *Aye-aye*, an animal of the most singular nature, which seems to be the object of a sort of veneration on the part of the inhabitants, and which partakes at the same time of the nature of the squirrel and of the monkey; the tenrecs, small insectivorous mammals, which have the back protected with spines or quills, like our hedgehogs, but which yet do not roll themselves up into a ball; the cleft-nosed chameleon, and several curious reptiles not found elsewhere, as well as insects no less characteristic of this region.

"Still proceeding onward and arriving in India, our traveler will find an elephant distinct from that of Africa; oxen, bears, rhinoceroses, antelopes, stags, equally different from those of Europe and of Africa; the orang-outang, and a number of other apes peculiar to these countries; the royal tiger, the argus, the peacock, the pheasant, and an almost innumerable multitude of birds, reptiles, and insects unknown elsewhere.

"Should he afterward visit New Holland, still every thing will be new to him, and the aspect of this fauna will appear to him still more strange than that of the various zoological populations he has already passed in review. He will there no longer find animals analogous to our oxen, horses, bears, and to a great number of our large carnivora: the quadrupeds of great stature will be found totally wanting, and he will discover the kangaroo, the flying phalanger, and the ornithorhynchus.

"Finally, if our traveler, in order to return to his native country, should traverse the vast continent of America, he will discover there a fauna analogous to that of the Old World, but composed almost entirely of different species: he will there find apes with prehensile tails; large carnivora, somewhat resembling the lions and tigers of the eastern continent, with bisons, lamas, tapirs; and finally birds, reptiles, and insects, equally remarkable, and equally new to him.

"Differences no less striking in the species of animals peculiar to different regions of the globe are observable, when, instead of confining our observation to the inhabitants of the land, we examine the myriads of living beings which dwell in the midst of the waters. In passing from the coast of Europe into the Indian Ocean, and from this last into the seas of America, we meet with



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fishes, molluscs, crustacea, and zoophytes peculiar to each of these parts of the sea. This localization of species, whether aquatic or terrestrial, is so well marked, that a naturalist a little experienced cannot mistake, even at first sight, the origin of zoological collections made in one or other of the great geographical divisions of the globe which may be submitted to his examination. The fauna of each of these divisions presents a peculiar aspect, and may be easily characterized by the presence of certain species, more or less remarkable.

"Naturalists have imagined several hypotheses to explain this mode of distribution of animals on the surface of the globe; but in the actual state of science it is impossible to give a satisfactory explanation, unless we admit that from the beginning of the actual geological period, the various species have been distributed in the different regions, and that by degrees they have afterward spread to a distance, so as to occupy a more or less considerable portion of the surface of the globe. In the actual condition of the earth, it is impossible for us to discover all the zoological focuses; for one may imagine the possibility of exchange so multiplied between two regions, the faunæ of which were primitively distinct, that they can only offer at the present moment species common to both, and thus nothing can reveal to the eyes of the naturalist their original separation; but when a country is found to be peopled with a considerable number of species not to be found elsewhere, even when the local circumstances are most similar, we shall be authorized to think that such a portion of the globe has always been a distinct zoological region."

In respect, then, to vegetable and animal products of the earth, there appear to be certain centers or circles in which the different kinds originated. In other words, as these species are originally found in these circles; as history places them here in the very earliest periods to which it carries us; and as we see them age after age confining themselves to their several localities as by a controlling law, it is deemed a logical inference that these were created in the places which they thus severally inhabit.

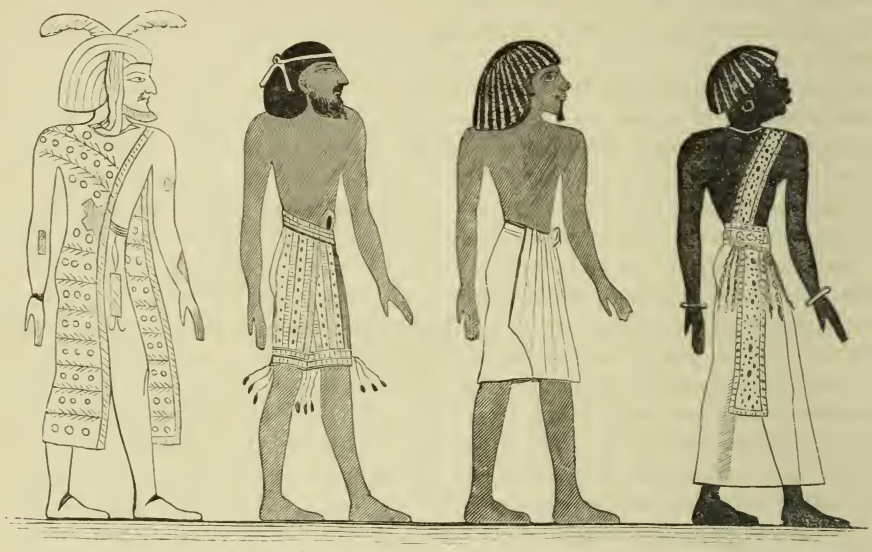
It is maintained that in the various races of the human family, a close analogy is found with these facts in the vegetable and animal world. It is remarked that in the polar regions, associated with the white bear, the walrus, and the rein-deer, we find the Esquimaux, the Lapps, and the Samoiedes, all of one race, and all from time immemorial inhabiting these Arctic realms. Here they remain as by some necessity, and here they have remained with little change since history first introduced them to our notice. So in Africa, we find the negroes of Congo in their places as truly as the hippopotamus and the chimpanzee: in the South, we find the Hottentot; in the Southeast, the Caffre; in the North, the Berber; in Madagascar, the Madecasses; in the valley of the Nile, the Egyptian; in Ethiopia, the Nubian,—and all these races confined to, or permanently associated with, their localities from the earliest records of time.

In a similar manner we find the Mongols in Central and Eastern Asia, the Hindoos in India, the Malays in the islands of the Pacific, the Papuans in New Guinea and New Holland, and finally the Indians in America, and all, so far as history furnishes us with any light on the subject, the primeval races of the several countries they inhabit, and all continuing from age to age in these their original domains. The Caucasian, or European race, as it is generally called, is held to consist of several mixed tribes or nations, originating in remote periods anterior to historical records, in the temperate portions of the eastern continent; and which, being of superior endowments, have broken from their original limits, and, like many animals and plants of a hardy and prolific nature, have spread themselves over various portions of the globe.

While it is thus assumed that a striking analogy exists between the tribes of men and the tribes of the vegetable and animal kingdom, as viewed in their geographical position and distribution, it is still further said that archæology enforces in a remarkable manner the same views. It is now known that the monuments of Egypt contain inscriptions which carry back the history of that remarkable people to a period at least four thousand years before the Christian era, and that at that time the nation was far advanced in civilization.* The sculptures and pictures upon the tem-

* The recent careful and profound study of the monuments of Egypt by Lepsius, Rossellini, and others, has established beyond a reasonable doubt the historical validity of Manetho's chronological list of the kings of Ancient Egypt, from Menes, the founder of the first dynasty. The date assigned to this monarch by late learned

ples and tombs are found to represent the Egyptian people through the whole period within the scope of history—a space of nearly six thousand years—as of the same physiological formation, and that of a distinct and peculiar type, represented by the Fellahs or true Egyptians of the present day. It appears, in fact, that the black, white, red, and yellow races were known and recognized as distinct types* 3300 years ago. The inference is, that not only the Egyptians, but the negroes



THE FOUR RACES OF THE EGYPTIAN MONUMENTS.

as well as the other races, however they may in some cases be modified by circumstances, are permanent types, extending through all time as far as they can be traced. Hence it is concluded that they are primordial races, or, in other words, original and distinct nations, created in their particular geographical centers, and, guided by a controlling law of nature, have remained from generation to generation, like the animal and vegetable tribes with which they are associated, in their original sites. The persistence of other historical nations in their physical characteristics, if not in their original habitats—as the Jews, Chinese, Mongols, Romans, Greeks, Huns, and others—is regarded as confirming this view of the subject. The late Dr. Morton, of Philadelphia, after a most elaborate examination of a vast number of skulls of different nations, including several from the ancient tombs of Egypt, came to the same general conclusion—viz., that mankind, from the dawnings of history, appear to have been divided into several races of distinct types as at the present day, and hence he concludes that they were, in the beginning, distinct creations.

It is obvious that this inquiry spreads over a vast field, which, however, has been explored with immense learning and research. We cannot pretend to do more than indicate the nature

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authors, differs somewhat, but they all fix the period nearly as far back as 4000 B. C. The following are the eras of Menes, according to the most reliable authorities:

Böeh	5702	Champollion-Figeac	5867
Barucchi	4890	Bunsen	3643
Lesueur	5773	Lepsius	3893
Rev. Dr. Hincks	3895	Rev. J. Kenrick	3892
Dr. Pickering	4400	Henry	5303

Whatever views may be taken of the origin of the human race, there is conclusive reason to believe that the common date of 4004 years B. C., derived from Archbishop Usher's Bible Chronology, for the period of the Mosaic creation and the beginning of mankind, is much too recent. It is probable that the actual date of man's creation is one of those secrets which will ever baffle human scrutiny; but that it is much further back in the records of time than has been usually supposed, is now regarded as certain by leading authorities.

* The above figures, copied from the Egyptian monuments, may be seen in the works of Lepsius, Rossellini, and Champollion.

of the investigation, and the leading trains of argument. Many of the allegations of those who maintain the unity of the human race are of course contradicted by their opponents. These admit that climate and situation may modify the physical as well as the moral character of races; but they insist that, inasmuch as the very organizations differ in essential points—such as the structure of the hair and skin, the shape of the legs, the position of the pelvis, the formation of the skull, the volume of the brain, &c., to say nothing of the differences in moral and mental qualities, which have been permanent for thousands of years—they cannot thus have transformed one type into another.

It has been argued for the specific unity of man, that the offspring of different species are hybrids, and incapable of continuous propagation, and hence, as the various races of men are prolific with each other, they must be of one species. To this it is replied, in the first place, that some hybrids among animals are, in fact, fertile to a certain extent; and, in the second place, it is asserted that the offspring of white and negro parents are so far unprolific, that if they continue to breed together, the race gradually becomes extinct.

It is further maintained, that by no influence either of moral or physical condition can the Caucasians be converted into negroes or the negroes into Caucasians. As the leopard cannot change his spots, so the Ethiopian cannot change his skin. The last was as much created with a certain type—physical, moral, and intellectual—as the other; and this, however it may be modified, can never be essentially changed, unless indeed by adulterations of blood.

"What the negroes are now," says Martin, "they were three thousand years ago. The period in which the change took place eludes investigation; nor can it be traced to the influence of climate or soil. A European, exposed to the fervid rays of the inter-tropics, will indeed become swarthy, tanned, and sunburnt, but not changed into a negro. The parts of his body not exposed will not be affected; his swarthiness is accidental and temporary; and his children will be of the ordinary degree of fairness. But the children of negroes, born in North America or Northern Europe—their children and their children's children—are still genuine negroes. If the color and form of the negro were conditions thus acquired, such conditions would not be fixed and perpetuated; for, though like produces like—though the race-horse, breeding with the race-horse, produces a race-horse, or the bull-dog, with its like, produces a bull-dog—still, the mere influence of climate, effecting, as it would seem, only superficial and transitory impressions, does not establish them upon the organization. No people, within the records of history, have been changed into a race of negroes.

"While, however, the negro retains his fixed and distinguishing characters, he is not only surrounded by the descendants of the European colonists, retaining theirs, but by African tribes, not negroes, differing in tint of skin, physiognomy, hair, and general contour. The Abyssinians, within ten degrees of the equator, and surrounded by negroes, have a dark olive-color, large, expressive eyes, and long hair. The Gallas, of the same latitudes, a nation of considerable extent, have also a brown skin and long hair. The natives of Timbuctoo are not negroes. In Madagascar, two or three distinct races exist—a true negro race, and an olive-colored, or yellowish-brown race, with crisp hair, termed by Lesson Madecasses, apparently of the Papuan stock; and besides these, what appears to be an aboriginal race, inhabiting the interior, with dark skins and lank hair, called Virzimbers, a branch of the great Alfouro nation, which is spread over the Moluccas, New Guinea, and which also inhabits the interior of the islands of the Indian Archipelago. That the negroes, then, do not owe their peculiarities to the mere effects of the heat of the torrid zone, need not be insisted on. The question then arises, whether their origin is to be attributed to that tendency to variation of form which obtains, more or less, throughout the animal kingdom, resulting from circumstances which elude our scrutiny, or whether they are aboriginal, and in this sense a distinct race? Could we pierce the darkness of antiquity, the obscure of by-gone time—could we work out a history of our species, commencing with man's first existence on the globe, we might solve a question on which many are divided, and to which each party brings plausible arguments. As it is, we must on many points remain in conjecture, or with only analogy to guide us. One thing is clear, that no external or physical causes with which physiologists are acquainted can change a nation of the Celtic or the Teutonic race into the negro, the Papuan, or Alfouro.

Formed *for* the regions they inhabit, and not *by* them, the true circumstances of their primordial rise are lost in the night of unrecorded ages.

"But supposing that the negroes, or that any well-defined races of mankind, be aboriginal, it does not follow that their specific identity with other races is therefore nullified. That they *are* of the same species with the other families of mankind, according to the received ideas of species, every circumstance tends to establish; nor does this admission interfere in one way or another with the question either as to their aboriginal creation, or as to their assumption at some unknown period of their distinguishing characteristics. If, by the command of the Creator, the earth became covered with grass and herbage—if forests sprung up on the hills—then must millions of the same species of the vegetable kingdom have simultaneously acquired existence; there is therefore little to startle us in the admission that such may have been the case also with respect to the animal kingdom."*

Finally, we may remark, that the important assumption, so powerfully argued by Prichard, that the psychological nature of all races is essentially the same in all nations and tribes, is flatly denied. "There exists," says Dr. Nott,† "not the slightest unity of thought on these recondite points,"—the existence of God and a future state. "Some believe in one God; the greater number in many: some believe in a future state, while others have no idea of a Deity, nor of the life hereafter. Many of the African and all Oceanic negroes possess only the crudest and most groveling superstitions."

Such is a brief outline of some of the leading arguments in favor of the diversity of origin in the human race. It is not to be denied that there is great force in these suggestions. It is due to truth also to say, that this doctrine is already maintained by some of the ablest naturalists and archæologists of the age, while the opinion of its correctness is doubtless becoming more and more extensive.

The friends of Christianity have regarded this state of things with some alarm, as it seems to be antagonistical to the Bible, which asserts the descent of all mankind from a single pair.

In reply to this, on the part of those who hold the contrary opinion, it is said that they by no means attempt to undermine the religious force of the sacred writings. They hold that it was not the purpose of Revelation to instruct mankind in natural science. In respect to subjects of this nature, they conceive that the authors of the Bible spoke as things appeared to their minds, within the range of their knowledge and experience. As the writer of the Pentateuch was acquainted only with the geography of a very limited portion of Asia and Africa, it was the whole world to him, and to this, therefore, we are to suppose his historical and descriptive passages refer. This, it is urged, is in fact no new opinion, it having been held by some of the early fathers of the church, and even by theologians of more modern date. Thus, in respect to the deluge, they regarded it as confined to that portion of Asia known to the patriarchal ages. These deemed it incredible that Noah could have brought into the ark a pair of every species of animals, including those of America, Oceanica, Europe, and Africa—countries wholly unknown to him and to the people of his age and nation. They held that the ark could by no possibility‡ have contained the countless species of the animal kingdom, and hence it is asserted that the Scriptures rather derive strength from an interpretation which confines the animals that the ark contained to those known in the region of the Euphrates, as any other view renders the whole account alike incredible and impossible. In short, the propagators of these new doctrines hold that the question under discussion is not theological, but scientific, as either conclusion leaves the great moral and religious doctrines of the Bible equally binding upon the consciences of mankind.

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* Martin's "Natural History of Man and Monkeys."

† See "Types of Mankind," p. 462.

‡ Some persons have attempted to explain the Mosaic account of the preservation of every species of animal in the ark, by supposing that only types of the several kinds were saved, and that the present diversity is the result of a principle of development inherent in the nature of all created things, animal and vegetable—a system of philosophy which was popularized in some degree by the author of "Vestiges of Creation," a few years since. Besides other fatal objections to this theory, there is this, in respect to animal and vegetable life, that during the five or six thousand years in which history instructs us, we have not a single instance or example in which a plant or animal has permanently changed its species, or shown any tendency to such a result.

The general results to which the new school of naturalists has arrived on this subject, are thus stated:

1. That the surface of our globe is naturally divided into several zoological provinces, each of which is a distinct center of creation, possessing a peculiar fauna and flora, and that every species of animal and plant was originally assigned to its appropriate province.

2. That the human family offers no exception to the general rule, but fully conforms to it—mankind being divided into several groups of races, each of which constitutes a primitive element in the fauna of its peculiar province.

3. That history affords no evidence of the transformation of one type into another, nor of the origination of a new and permanent type.

4. That certain types have been permanent through all recorded time, and despite moral and physical influences.

5. That permanence of type is accepted by science as the surest test of specific character.

6. That certain types have existed, the same as now, in and around the valley of the Nile, from ages anterior to 3500 years before Christ, and consequently long prior to any alphabetic chronicles, sacred or profane.

7. That the ancient Egyptians had already classified mankind, as known to them, into four races, previously to any date assignable to Moses.

8. That high antiquity for distinct races is amply sustained by linguistic researches, by psychological history, and by anatomical characteristics.

9. That the primeval existence of man, in widely separate portions of the globe, is proven by the discovery of his osseous and industrial remains in alluvial deposits and in alluvial drifts, and more especially of his fossil bones, imbedded in various rocky strata along with the vestiges of extinct species of animals.

10. That prolificacy of distinct species, *inter se*, is now proved to be no test of common origin.

11. That those races of men most separated in physical organization, such as the blacks and the whites, do not amalgamate perfectly, but obey the laws of hybridity. Hence,

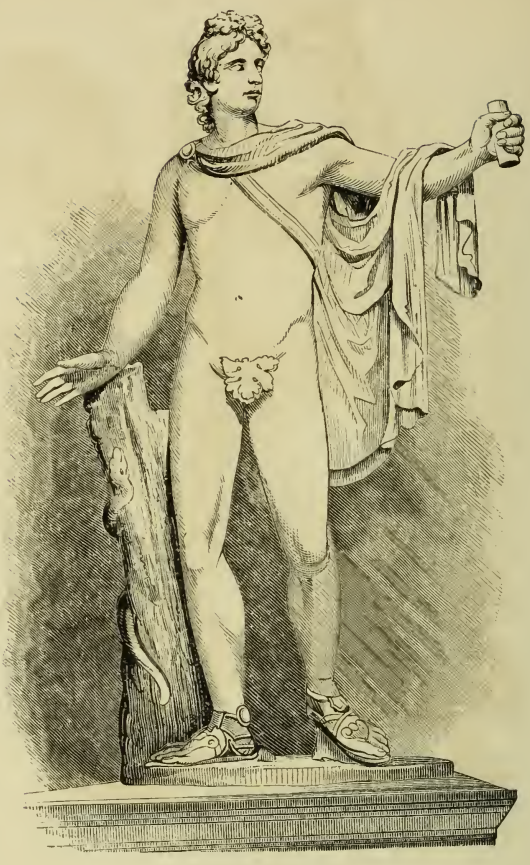
12. It follows, as a corollary, that there exists a *Genus Homo*, embracing many primordial types or "species."*

Having thus briefly stated the arguments upon which the two theories rest, we have but to add, that we remain in the belief of the unity of the great human family. Notwithstanding the diversities which they present, they are still united in having essentially the same organization; the same capacity for language and indefinite improvement; in all there is an evident design that the intellectual and moral shall predominate over and control the physical nature; among them all there is a capacity for the mingling of blood and the pervading bonds of brotherhood; in all there is a general belief in the immortality of the soul and a state of future rewards and punishments. As mankind agree in so many points, we believe them to be of one race, one blood, one species, one destiny.

CLASSIFICATION OF THE VARIOUS RACES OF MANKIND.

Although we have conceived it necessary, in our sketch of zoological science, to state these views, and to admit that they are worthy of grave consideration, yet, as we have said, the weight of opinion and authority is in favor of the unity of the human family. Assuming this, however, there are still great diversities in the several races. These have been variously classified by different authors; but it must be remembered that the divisions and subdivisions which are thus employed, do not resemble those which are used in the systematic classification of plants and animals. When the whole of the species of the vegetable or the animal kingdom are to be arranged, we divide them into various primary and subordinate groups, which are called divisions, classes, orders, genera, species, and varieties. Now man himself is but a species; he belongs to a subordinate group of a large division of the animal kingdom. Zoologically considered, man is an animal be-

* See "Types of Mankind," p. 465.



CAUCASIAN TYPE.

longing to the division *Vertebrata*, the class *Mammalia*, the order *Bimana* or *Hominidæ*, genus *Homo*, and species *Sapiens*. Blumenbach divides the species into five varieties, whose characters are as follows:

1. CAUCASIAN VARIETY.

A white skin, either with a fair rosy tint, or inclining to brown; red cheeks; hair black, or of the various lighter colors, copious, soft, and generally curved or waving. Irides dark in those with brown skin; light in the fair or rosy complexioned. Large cranium with small face; the upper and anterior regions of the former particularly developed, and the latter falling perpendicularly under them. Face oval and straight, with distinct features; expanded forehead, narrow and rather aquiline nose, and small mouth; front teeth of both jaws perpendicular; lips, particularly the lower, gently turned out; chin full and rounded. Moral feelings and intellectual powers most energetic, and susceptible of the highest development and culture.

"The Caucasian," says an eloquent writer, "differs from all other races: he is humane, he is civilized, and progresses. He conquers with his head as well as with his hand: it is intellect, after all, that conquers—not the strength of a man's arm. The Caucasian has been often master of the other races—never their slaves. He has carried his religion to other races, but never taken theirs. In history, all religions are of Caucasian origin. All the great limited forms of monarchies are Caucasian: republics are Caucasian. All the great sciences are of Caucasian origin: all inventions are Caucasian: literature and romance come of the same stock. All the great poets are of Caucasian origin: Moses, Luther, Jesus Christ, Zoroaster, Buddha, Pythagoras, were Caucasian. No other race can bring up to memory such celebrated names as the Caucasian race. The



MONGOLIAN: GENGHIS KHAN.

Chinese philosopher, Confucius, is an exception to the rule. To the Caucasian race belong the Arabian, Persian, Hebrew, Egyptian; and all the European nations are descended of the Caucasian race."

This variety includes all the ancient and modern Europeans except the Finns; the former and present inhabitants of Western Asia, as far as the river Oby, the Caspian Sea, and the Ganges,—that is, the Assyrians, Medes, and Chaldeans; the Sarmatians, Scythians, and Parthians; the Philistines, Phenicians, Jews, and the inhabitants of Syria generally; the Tartars, properly so called; the tribes actually occupying the chain of Caucasus; the Georgians, Circassians, Mingrelians, Armenians; the Turks, Persians, Arabians, Afghans, and Hindoos of high castes; and the northern Africans, the Egyptians, Abyssinians, and Guanches.

2. THE MONGOLIAN VARIETY.

Characterized by olive-color, which in many cases is very light, and black eyes; black, straight, strong, and thin hair; little or no beard; head of a square form, with small and low forehead; broad and flattened face, with the features running together; the glabella flat and very broad; nose small and flat; rounded cheeks, projecting externally; narrow and linear aperture of the eyelids; eyes placed very obliquely; slight projection of the chin; large ears; thick lips; stature, particularly in the countries near the north pole, inferior to that of Europeans.

It thus includes the tribes of Central and Northern Asia, as the Mongols, Calmucks, and Buriats; the Mantchoos, Daürians, Tungooses, and Coreans; the Samoiedes, Yukagers, Tschuktschi, Koriacs, and Kamtchatkadales; the Chinese and Japanese; the inhabitants of Tibet and Bootan, of Tonquin, Cochin China, Ava, Pegu, Cambodia, Laos, and Siam; the Finnish races of Northern Europe, as the Laplanders and the tribes of Esquimaux.

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AFRICAN NEGRO: KING OF ASHANTEE.

3. THE ETHIOPIAN VARIETY.

Skin and eyes black; hair black and woolly; skull compressed laterally, and elongated toward the front; forehead low, narrow, and slanting; cheek-bones prominent; jaws narrow and projecting; upper front teeth oblique; chin receding. The eyes prominent; the nose broad, thick, flat, and confused with the extended jaw; the lips, and particularly the upper one, thick.

All the natives of Africa, not included in the first variety, belong to this.

4. THE AMERICAN VARIETY.

Skin dark, and more or less of a red tint; black, straight, and strong hair; small beard; and a countenance and skull very similar to the Mongolian. The forehead low; the eyes deep; the face broad, particularly across the cheeks, but not so flattened as in the Mongols; mouth large, and lips rather thick.

This variety includes all the aboriginal Americans except the Esquimaux. Nevertheless, there seems to be some difference between the Toltec family which founded Mexico and Peru and the great mass of inferior tribes which remained in a barbarous state. "One of the most singular features in the history of the American continent," says Cuvier, "is, that the aboriginal races, with few exceptions, have perished, or constantly receded, before the Anglo-Saxon race, and have in no instance either mingled with them as equals, or adopted their manners and civilization."

"The barbarous races of America," says Dr. Nott, "excluding the Toltecs, are essentially un-



AMERICAN INDIAN: LOGAN, THE MINGO CHIEF.

tamable, not merely because all attempts to civilize them have failed, but also every endeavor to enslave them. Our Indian tribes submit to extermination, rather than wear the yoke under which our negro slaves fatten and multiply. It has been falsely asserted that the *Choctaw* and *Cherokee* Indians have made great progress in civilization. I assert positively, after most ample investigation of the facts, that the pure-blooded Indians are everywhere unchanged in their habits. Many white persons settling among the above tribes have intermarried with them, and all such trumpeted progress exists among these whites and their mixed breeds, alone. The pure-blooded savage still skulks untamed through the forest, or gallops athwart the prairie. Can any one call the name of a single pure Indian of the *barbarous* tribes, who—except in death, like a wild-cat—has done any thing worthy of remembrance?"

5. THE MALAY VARIETY.

Brown color, from a light tawny to a deep brown. Hair black, more or less curled, and abundant; head rather narrow; bones of the face large and prominent; nose full, and broad toward the apex; mouth large. In this are included the inhabitants of Malacca, of Sumatra, Java, Borneo, Celebes, and the adjacent Asiatic islands; of the Molucca, Ladrone, Philippine, Marian, and Caroline groups; of Australia, Van Diemen's Land, New Guinea, New Zealand, and of all the islands of the South Sea.

The epithet *Oceanic* is sometimes applied to this group, because, with the exception of the peninsula of Malacca, the tribes belonging to it are the inhabitants of islands exclusively. With the exception of Mauritius, the Isle of Bourbon, Ceylon, the Seychelles, the Maldives, and the Laccadives



MALAY.

in the Indian Ocean, and the Japanese empire, with the islands to the north thereof in the Chinese Sea, every inhabited spot of land in the Indian and Pacific Oceans is occupied by tribes of one and the same race which is embraced by this division. Not only is this race to be found spread over these islands, but apparently nowhere else. "In the peninsula of Malacca," says Dr. Latham, "and on no other part of the main-land of Asia, is an Oceanic tribe to be detected." Although united by naturalists, the Oceanic races exhibit two types. One class is yellow, olive, brunette, or brown, with long, black, and straight hair. Another class is black rather than yellow; the hair is sometimes long and straight, but in other cases crisp, curly, frizzy, or even woolly. The social, moral, and intellectual difference between these two classes is not less than their physical. The black division inhabits New Guinea, Australia, Tasmania, New Ireland, and the islands between it and New Caledonia. The brown division occupies all the rest of the Oceanic area, Sumatra, Borneo, Java, the Moluccas, the Philippines, the South Sea Islands, the Carolinas, &c. The names given to these divisions are as follows:

1. For the lighter-complexioned straight-haired type—*Malay.*

2. For the type that partakes of the character of the African negro inhabiting New Guinea, Australia, and what may be called the continuous localities for the unmixed black—*Negrito.*



ORDER 2. **QUADRUMANA.**

The Quadrumana embrace four sections—the *Monkey-like* family, the *Lemurs*, the *Cheiromys*, or *Aye-aye*, and the *Flying-lemurs*. These differ in many important respects, yet they all agree in having four hands, fitting them peculiarly for an arboral existence. In many of the species the anterior limbs have but four fingers, with the thumbs confined to the hind feet. Notwithstanding their conformation, they are all as true quadrupeds as most of the clawed mammalia, for in a state of nature they appear never to walk on the hind legs, which are in fact too weak to be employed, as in the human subject, for the sole organs of locomotion; and besides, the structure of the foot, even in those most resembling man, is such that when on the ground it treads on the side, and not on the palm. The legs also are set in such a manner as to tread outward, and thus to be incapable of bearing a great weight.

THE MONKEY-LIKE ANIMALS: SIMIADÆ.

These, which are greatly diversified in form, are exceedingly numerous in species. They include the *Apes*, *Semnopithecs*, *Colobes*, *Guenons*, or *Cercopithecs*, *Mangabeys*, *Macakes*, *Magots*, *Cynopithecs*, and *Baboons*, belonging to the Eastern Continent, and, with the exception of a few Barbary apes at Gibraltar, confined to Asia and Africa; and the *Howlers*, *Lagothrix*, *Eriodes*, *Ateles*, *Sajous*, *Callithrix*, *Saimiri*, *Nyctipithecs*, *Sakis*, and *Ouistitis*, belonging to the Western Continent. All are natives of hot countries, and are incapable of subsisting in cold and temperate climates, except by the aid of man.

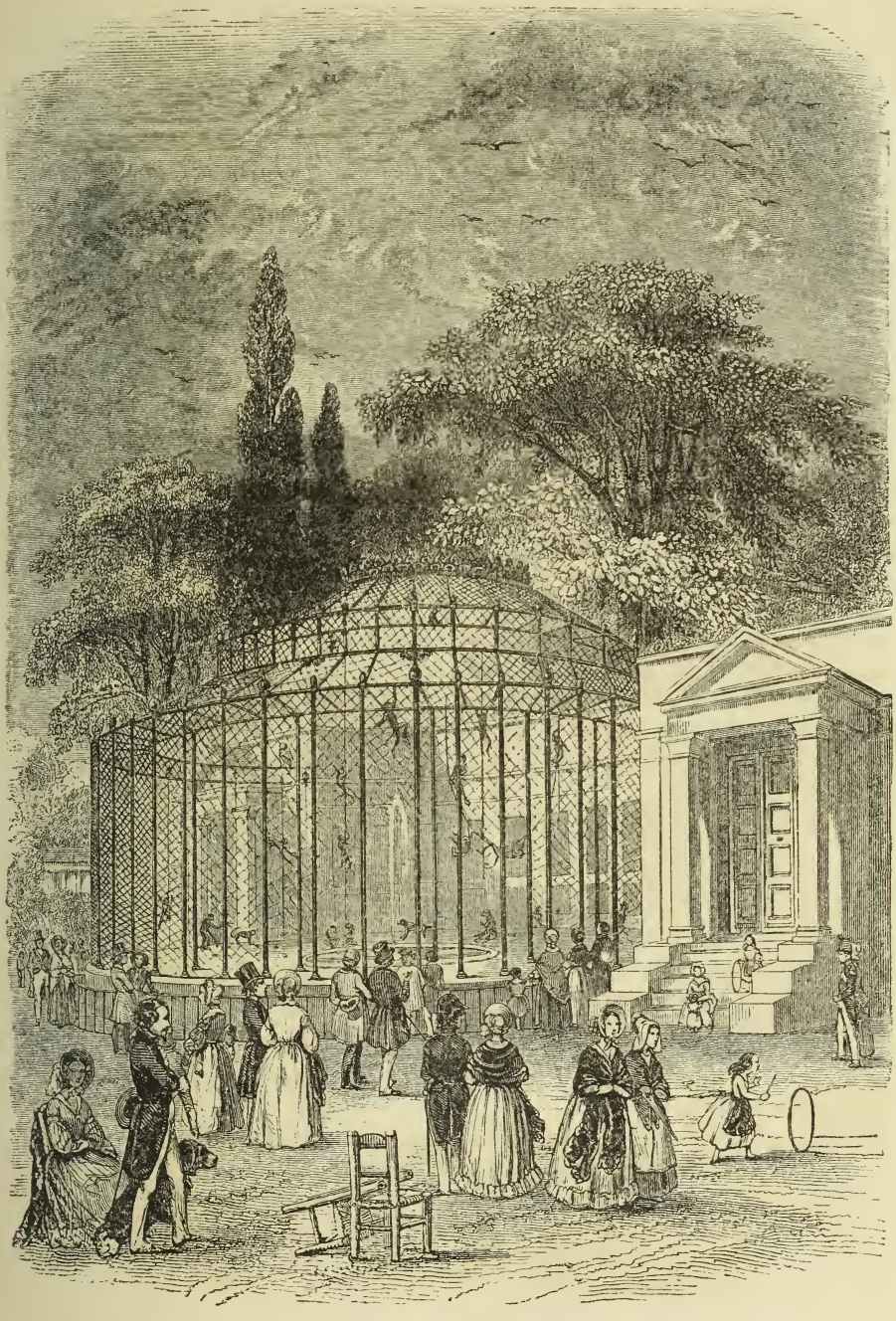
In addition to the hands on the posterior as well as anterior members, with long and flexible fingers and opposable thumbs, which constitute the primary characters of the order, the monkey tribe in general is distinguished by the following peculiarities. Their incisor teeth are invariably four in each jaw; and their molars, like those of man, are flat, and surmounted by blunted tubercles. The latter are five in number on each side of either jaw, in all the monkeys of the old continent, and in one very distinct tribe belonging to the new; but most of the American species are furnished with a sixth. Their canines vary considerably in size, and form a trifling projection beyond the remaining teeth, to a long powerful tusk, almost equaling those of the most formidable carnivora; and from this structure it necessarily follows that a vacant space is left between the incisors



BRAZILIAN FOREST: THE MONKEYS AT HOME.

and the canines of the upper jaw, and between the canines and the molars of the lower, for the reception and lodgment of those organs when the mouth is closed. The nails of all their fingers, as well as those of the thumbs, are invariably flat and expanded.

In almost every other point, they are subject to infinite variations of form and structure. The shape of the head, which in one or two species offers a close approximation to the human form, passes through numerous intermediate gradations, until it reaches a point at which it can only be compared with that of the hound. The body, which is in general slight and well-made, is in some



GARDEN OF PLANTS, PARIS: THE MONKEYS ABROAD.

few instances remarkably short and thick-set, and in others drawn out to a surprising degree of tenuity. Their limbs vary greatly in their proportions, but in most of them the anterior are longer than the posterior: in all, they are admirably adapted to the purposes to which they are applied in climbing and leaping, by the slenderness of their form, the flexibility of their joints, and the muscular activity with which these qualities are so strikingly combined. But of all their organs, there is perhaps none which exhibits so remarkable a discrepancy in every particular as the tail, which is entirely wanting in some, forms a mere tubercle in others, in a third group is short and

tapering, in a fourth of moderate length and cylindrical, in a fifth extremely long, but uniformly covered with hair; in others, again, of equal length, divested of hair beneath and near the tip, and capable of being twisted round the branch of a tree, or any other similar substance, in such a manner as to support the whole weight of the animal, even without the assistance of its hands.

In none of them, it may be observed, are the hands formed for swimming, or the nails constructed for digging the earth; and in none of them is the naked, callous portion, which corresponds to the sole or the palm, capable of being applied, like the feet of man or of the bear, to the flat surfaces on which they may occasionally tread. Even in those which have the greatest propensity to assume an upright posture, the body is, under such circumstances, wholly supported by the outer margins of the posterior hands. The earth, in fact, is not their proper place of abode; they are essentially inhabitants of trees, and every part of their organization is admirably fitted for the mode of life to which they were destined by the hand of nature herself.

Throughout the vast forests of Asia,* Africa, and South America, and more especially in those portions of these continents which are comprehended within the tropics, they congregate in numerous troops, bounding rapidly from branch to branch, and from tree to tree, in search of the fruits and eggs which constitute their principal means of subsistence. In the course of these peregrinations, which are frequently executed with a velocity scarcely to be followed by the eye, they seem to give a momentary, and but a momentary, attention to every remarkable object that falls in their way, but never appear to remember it again, for they will examine the same object with the same rapidity as often as it occurs, and apparently without in the least recognizing it as that which they had seen before. They pass on a sudden from a state of seeming tranquillity to the most violent demonstrations of passion and sensuality, and in the course of a few minutes run through all the various phases of gesture and action of which they are capable, and for which their peculiar conformation affords ample scope. The females treat their young with the greatest tenderness until they become capable of shifting for themselves, when they turn them loose upon the world, and conduct toward them from that time forward in the same manner as toward the most perfect strangers.

The degrees of their intelligence, which in general is very limited, and is not capable of being made subservient to the purposes of man, except as a show in a menagerie, vary almost as much as the ever-changing outline of their form. From the grave and reflective orang-outang, whose docility and powers of imitation in his young state have been the theme of great wonder and equal exaggeration, to the coarse and brutal baboon, the gradations are gradual and easy. A remarkable circumstance connected with the development of the faculty of being educated, or perhaps we should rather say, with its gradual extinction, consists in the fact, that it is only in young animals which have not yet attained their full growth that it is capable of being brought into play,—the older individuals, even of the most tractable races, entirely losing their gayety, and with it the docility of their youth, and becoming at length nearly as stupid and as savage as the most barbarous of the tribe.

Although, as we have said, nearly all the monkeys, as well as the apes, live on fruits and the eggs of birds, still many of them devour small birds and quadrupeds, and some occasionally feed on fish. We are told that certain species display great address in getting at the flesh of shell-fish. The oysters of the tropical climates being larger than ours, the monkeys, when they reach the sea-side, pick up stones and thrust them between the open shells, which being thus prevented from closing, the cunning animals eat the fish at their ease. In order to attract crabs, they put their tails before the holes in which they have taken refuge. When they have fastened on the bait, the monkeys suddenly withdraw their tails, and thus drag their prey on shore.

It is to be remarked that our acquaintance with the monkey tribe is chiefly founded upon

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* In the Garden of Plants, at Paris, there is a large circular rotunda, inclosed by wire, within which the numerous monkeys of the establishment are permitted to go at large. Here may be seen almost every variety, from the large and grave chimpanzee to the ouistiti, little and lively as a squirrel. This gallery is the favorite resort of spectators, and especially of children. Nothing can exceed the tricks, caprices, frolics, and grimaces of these four-handed people—many of their actions being exceedingly ludicrous from their resemblance to things we have all seen in certain people of our acquaintance. (See engraving, p. 57.)

species in a state of confinement. We are liable, therefore, to view them in a false light. As inhabitants of the wild overgrown forests of tropical countries, living without care on the spontaneous products of nature, gifted with amazing powers of leaping, climbing, and swinging amid the leafy branches of the trees—endowed with a ceaseless spirit of activity—inspired with an irresistible love of frolic and fun—they seem happily designed, in companionship with bright-winged birds and gorgeous flowers, to embellish the pathless wilderness, their home. Taken from this, and brought into the society of man, they are not only in situations altogether at variance with their nature, but they are apt to be regarded as disgusting caricatures of him who claims to be the lord of creation. Men hate caricatures, especially those which reflect their follies and their weaknesses in a manner to make them ridiculous, and hence there is a standing grudge on the part of man against the monkey. This spite is well displayed in the attempt of certain theologians to prove the Serpent of Paradise to have been an ape.



See page 58.

Nevertheless, caricatures as they may be, monkeys are exceedingly diverting creatures, and are the great attraction of all menageries. At Barnum's Museum, in New York, there is a collection of incongruous animals—monkeys of various kinds, a cat, a dog, several rats, a peccary, a hen, a rooster, a hawk, a capybara, a coati, &c.—all living peaceably together, and called the "Happy Family." Though somewhat subdued by their situation, these creatures severally indicate something of their natures. Pussy sleeps; the peccary is restless, and utters impatient grunts; the rats crawl and nestle together; the coati rushes from side to side, seeking to find a place in the grating by which he may escape; and in the midst of all this, the monkeys rollick with one another, making an occasional dash, like mischievous boys, at the other animals, to tease and irritate them. Children spectators always regard these monkeys as the heroes of the play.

The Monkeys of the Old and the New World differ from each other in several remarkable points, some of which are characteristic of all the species of each; while others, although affording good and tangible means of discrimination, are but partially applicable. Thus the nostrils of all the species inhabiting the Old World are anterior, like those of man, and divided only by a narrow septum: in those of the New World, on the contrary, they are invariably separated by a broad division, and consequently occupy a position more or less lateral. It is from this difference of structure that the former are denominated *Catarrhinæ*, from the Greek *kata*, downward, and *rhin*, nose; and the latter *Platyrrhinæ*, from the Greek *platus*, flat, and *rhin*, nose: these terms being descriptive of the two families.

The tails of all the American monkeys are of great length, but they differ more or less from each other in the power of suspending themselves by means of that organ—a faculty which is nevertheless common to the greater number of them, and of which those of the Old World are entirely destitute. On the other hand, the American species never exhibit any traces of two remarkable provisions—the callosities on the haunches or of the cheek-pouches; both of which are nearly universal with the monkeys proper of the Asiatic and African races. For the former of these peculiarities, no use is known; the cheek-pouches, which are membraneous sacks on each side of the mouth, are employed to carry food, and some are sufficiently capacious to hold a supply for two days. These characteristics do not belong to the higher apes.

We shall embrace our description of the monkey family under the following divisions: 1st, The True Apes; 2d, The Old-World Monkeys; 3d, The American Monkeys.



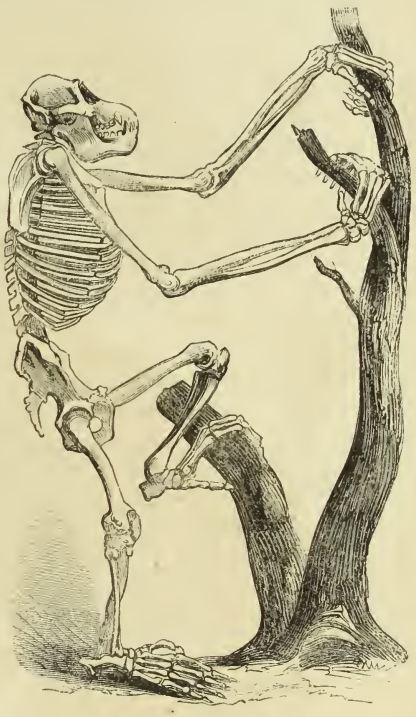
THE CHIMPANZEE, CALLED JACQUELINE, AT THE GARDEN OF PLANTS, PARIS.

1. THE TRUE APES: ANTHROPOMORPHA.

The leading group of the quadrumana is that in which the animals are destitute alike of tails and cheek-pouches. These are called the *anthropomorphous* apes, as they possess the highest intelligence, and the greatest resemblance to man in their structure. Of these, there are three genera—those of the *Chimpanzee*, the *Orang*, and the *Gibbon*. In regard to the species belonging to these, there has been until recently great confusion. Buffon considered the chimpanzee as identical with the orang, but it is ascertained to be distinct. The gorilla was also supposed to be the same as the chimpanzee: it is now known to be a separate species. The pongo was regarded as a distinct species, but has proved to be the adult orang.

Genus CHIMPANZEE, or *Kimpanze*, *Troglodytes*.—Of this genus there are two species—the common *Chimpanzee* and the *Gorilla*.

The CHIMPANZEE, *Troglodytes niger*—sometimes called the *Black Orang*—is a native of Guinea and the adjacent country, and has been long known in Europe. It is more like the human species than any other of the animal tribes. "Indeed, every one," says M. Boitard, "on observing a chimpanzee for the first time, is struck with his great resemblance to mankind, not only in his form, but in his actions, his gestures, and even some of his habits. The various names he has received in his native country are proofs of this fact. The negroes call him *Pongo*, which is also the name of one of their great fetiches, a sort of forest genius; in Angola, they call him *cojas morros*, which in their language signifies *Man of the forest;* in Congo, he is called the *Eujoko*, which in the language of the country is the imperative of the verb to hold one's tongue—that is, '*Eujoko*, hold your tongue!' We conceive the origin of the name, in the fact that the negroes of Congo imagine that the chimpanzee does not speak because he does not wish to do so, for he fears he should be made a slave, and forced to work. But all these words are merely epithets added to the word *kimpanze*, under which title he is known to all the natives on the coast of Guinea. The traveler Lecat calls the name *kimpézey*, and G. Cuvier *chimpanzé*." We may further remark, that the chimpanzee is the only one of the quadrumana that can walk erect with tolerable ease.



SKELETON OF CHIMPANZEE.

Its nose is quite flat, and the nostrils open upward. The mouth is wide, and the lips thin. The ears are large, thin, and naked. Its height is about four and a half or five feet, when it stands up; its body is covered with black hair, except the face, which is nearly naked, and approaches the color of flesh. In youth, the shape of its skull greatly resembles that of man, but as it advances in age, the facial angle grows more acute, until at full maturity it resembles that of the baboon. Its character seems to undergo corresponding changes, for while young it is gentle and docile, yet becomes fierce and intractable when it has attained its full growth,—a remark that is equally applicable to the other apes. Most of the accounts which we have had of the chimpanzee, giving it a high character for docility and amiableness, have reference to young specimens.

The habits of this species in a state of nature have been imperfectly known, and hence the subject has been embellished with a multitude of curious marvels. It appears that they live in small troops in the deep forests, and subsist mainly on vegetable food. They construct for themselves huts of branches and leaves, in the trees. These are, however, very slight and rude, and are not roofed over,—a circumstance which subjects them to the scoffs of the negroes. These cabins are only occupied during storms and in cases of sickness. At other times, these creatures sleep in the open air upon the branches of trees, sitting on their hind-legs, the body bent forward and the head resting on the breast. They are, in fact, like other members of the family, arboral animals, though it may be said that the chimpanzee is more at home on the ground than any other species. They run on their lower extremities without difficulty, holding up the arms, or grasping the thighs with their hands, though this is not their usual mode of progression. They are said to unite in pairs. The female is very careful of her young, caressing it with the utmost tenderness. She carries it on her arms, in the manner of a nurse, when she has but a short distance to go; but if she has a journey to perform, she places the little one on her back, where it clings to its mother precisely in the manner of the little negroes. She is fondly attached to her young ones,

and keeps them with her long after they are weaned. The male, on the contrary, chases them away as soon as they are capable of obtaining a living.

So much appears to be well authenticated. The natives of the Gaboon country, where they seem to be most common, assert that these animals frequently unite to attack the elephant, lion, and other beasts of prey, with clubs and stones, especially if they approach their cabins. It is also said to be dangerous for individuals to venture alone into their domains. So far, the story is probable; but when we are told that these animals bury their dead, and cover them in a manner to defend them from the hyenas; that they dress gun-shot and other wounds with pounded herbs, and bind up the parts with strips of bark; and, finally, that the males frequently carry off and make companions of young negresses, whom they treat with great tenderness, so that some of them who have returned from this captivity expressed themselves extremely well satisfied with their adventures;—we may well conclude that we have entered the regions of romance.

The accounts of the chimpanzee in a state of captivity are full of interest. Buffon describes one which he saw, and which at that time he supposed to be the same as the orang, as follows: "I have seen this animal give his hand to people who visited him, walking gravely with them as if one of them; I have seen him seat himself at the table, unfold his napkin, wipe his mouth with it, use his knife and fork to eat with, and pour water into his glass and drink the health of those who visited him; I have seen him take a cup and saucer, bring them to the table, put in the sugar, pour in the tea, allow it to cool before he drank it, and all this without any other motion than a word or sign from his keeper, and often of his own accord. He was extravagantly fond of bonbons: he drank wine in small quantities, but preferred milk, or tea, or other mild drinks.

"In captivity," he adds, "the chimpanzee, if one can believe what travelers say, can be as useful as the negroes. At Loango, a female chimpanzee had been seen to fetch water in a pitcher, and to bring wood from the forest; she would also make beds, sweep, and assist the cook to turn the spit, &c. She once fell sick; a physician bled her, and by so doing saved her life. A year after, being threatened with inflammation of the lungs, she was confined to her bed. When the same physician was called to attend her, she held out her arm to him, and made signs to him to bleed her."

M. De Grandpré, an officer in the French marine, nearly a century since, having lived in Angola two years, gives us the following particulars: "The intelligence of the chimpanzee is truly wonderful: he sometimes walks upright, and leans upon the branch of a tree in the manner of a cane. The negroes are in great fear of him in his wild state; and not without reason, for he often ill treats them when they meet him. They say that it is only from idleness that he refrains from speaking, or perhaps from the fear of being made to work; as they are confident that these animals can both talk and work like men, if they will. Of this the negroes are so strongly persuaded, that when they meet them they generally address them as if they were human beings.

"Notwithstanding all my efforts to procure an individual of this species, I have met with no success; but I have seen a female on board a vessel, and wishing to measure and examine her, she allowed me to do it with great complaisance and evident interest. As it would be tedious to recount all that I learned of the intelligence of this animal, I will give only the most remarkable instances. She had been taught to heat the oven, using great discretion in her manner of putting in the wood, and watching narrowly that the coals should not fall and set the vessel on fire. She waited until she thought the oven sufficiently hot for baking, and then ran to tell the cook, who, sure of the sagacity of his assistant, hurried to put in his bread or cake, the animal never failing in a single instance to warn him at the proper time.

"In turning the capstan, she assisted the sailors, and performed her part with more skill and strength than were showed by any of them. When the sails were to be unfurled, she went aloft with the sailors and assisted them in the work: she would have insisted upon performing the most dangerous services, if the men had allowed it. She tied the ropes as well as any of them; and observing that the ends were tied to prevent their hanging down, she did the same to the ropes of which she was in charge. Her hand one day being caught between the bolt-rope and the yard, she disengaged it without making either outcry or grimace: when the work was fin-

ished, she showed her superiority in agility by passing over the bodies of the men and descending to the deck in the twinkling of an eye.

"This interesting animal died on the passage to America, owing to the brutality of the mate, who treated her with great unkindness. She submitted to his violence with a mildness and resignation that were truly affecting, holding out her hands with a suppliant air, as if to beg him to cease from striking her. From that moment she constantly refused nourishment, and died of hunger and grief on the fifth day, regretted by the sailors as if she had been a human being."

Among the most recent accounts is that of Captain Payne, who thus describes the manners of a young chimpanzee which he carried from the African coast to England a few years since:

"When our animal came on board, it shook hands with some of the sailors, but refused its hand with marks of anger to others without any apparent cause. It speedily, however, became familiar with the crew, except one boy, to whom it never was reconciled. When the seamen's mess was brought on deck, it was a constant attendant; would go round and embrace each person, while it uttered loud yells, and then seat itself among them to share the repast. It sometimes expressed its anger by a barking noise like a dog; at others it would cry like a froward child, and scratch itself most vehemently. When any favorite morsel was given to it—sweetmeats more especially—it expressed its satisfaction by a sound like 'hem,' in a grave voice. The variety of its tones seems to have been small. It was active and cheerful in warm latitudes, but languor came on as it left the torrid zone; and on approaching our shores it manifested a desire for warm covering, and would roll itself carefully up in a blanket when it went to rest. It generally progressed on all-fours, but closing its fists, rested on the knuckles. It did not seem fond of the erect posture, which it rarely affected, though it could run nimbly on two feet for a short distance. In this case it appeared to aid the motion of its legs by grasping the thighs with its hands.

"It had great strength in the four fingers of its superior extremity, for it would often swing by them on a rope upward of an hour without intermission. When first procured, it was so thickly covered with hair that the skin of the trunk and limbs was scarcely visible until the long black hair was blown aside. It ate readily every sort of vegetable food; but at first did not appear to relish flesh, though it seemed to have pleasure in sucking the leg-bone of a fowl. At that time it did not relish wine, but afterward seemed to like it, though it never could endure ardent spirits. It once stole a bottle of wine, which it uncorked with its teeth and began to drink. It showed a predilection for coffee, and was immoderately fond of sweet articles of food. It learned to feed itself with a spoon, to drink out of a glass, and showed a general disposition to imitate the actions of men. It was attracted by bright metals, seemed to take a pride in clothing, and often put a cocked hat on its head. It was dirty in its habits, and never was known to wash itself. It was afraid of fire-arms, and on the whole appeared a timid animal."

It lived with Captain Payne seventeen weeks, two of which were spent in Cork and Liverpool. At the former place it was exhibited for the benefit of the soup-kitchen for a few days, but seems to have been there neglected. On coming to Liverpool it languished for a short time, moaned heavily, was oppressed in its breathings, and died with convulsive motions of the limbs.

A few years since, the Parisians flocked to the Garden of Plants to see a young female of this species, called Jacqueline. She was good, mild, and affectionate. She recognized perfectly the people who often visited her, and showed her pleasure by caressing them. If any one teased her, she would sob and cry like an infant, go into the corner of her cell, and pout for some moments in silence. But her anger gave way before the least sign of kindness; she then wiped her eyes, and came back without vexation to those who had offended her. M. Boitard thus describes this animal:

"Although she was very young, being only two years and a half old, her intelligence was already quite developed. Of this, I will give two examples, which I think remarkable, and of which I was an eye-witness. One of my friends having taken off his gloves, laid them on the table. Jacqueline immediately took them and tried to put them on, but she could not succeed in her wish, because she put the right hand into the left-hand glove. She was shown her mistake, and she comprehended so perfectly, that, although she has often been tried since, she has never failed to put the right hand in the right glove.

"M. Werner, a celebrated painter of natural history, wished to make a sketch of her. Jacqueline showed great surprise on seeing her image on the paper, and made signs that she wished to draw also. They gave her a pencil and paper, and seating herself gravely at the table of the artist, traced with great joy some large figures and lines. As she bore on heavily, the point of her pencil broke, and she was very much vexed. To console her, the drawing-master cut her pencil, and, learning by experience, she did not bear on so heavily the next time. Having observed M. Werner put the point of the pencil into his mouth, she did the same, but in so doing she always broke the point with her teeth. It was impossible to prevent this, and so they were obliged to put an end to her artistic studies. She tried to sew, in imitation of the woman who took care of her, but she constantly pricked her fingers. She therefore threw her work away, and jumping upon a rope that had been stretched across the room for her amusement, she made some turnovers that would have astonished the boldest rope-dancer.

"Jacqueline had a dog and cat that she was very fond of. She allowed them to sleep with her, one on each side; but notwithstanding this apparent familiarity, she knew how to preserve the place due to her on account of her superior intelligence, and when she judged it necessary, chastised them severely to make them obedient to her, and to force them to live together without quarreling.

"Poor Jacqueline was in the habit of washing her hands and face every morning with cold water. These ablutions, added to the rigors of a climate so different from that of Africa, probably caused the consumption of which she died. Jack, the orang-outang that had lived in the cell before her arrival, and also the chimpanzees formerly owned by Buffon and the Empress Josephine, died of the same disease."

Many other accounts have been furnished of the chimpanzee, from which we select the following description of a young male of this species: it was read before the Zoological Society of London, October 27th, 1835, by Mr. Broderip. Its habits, in a state of confinement, are drawn with graphic power and a spirit truly delightful:

"The interesting animal whose habits in captivity I attempt to describe, was brought to Bristol in the autumn of this year, by Captain Wood, from the Gambia coast. The natives, from whom he received it, stated that they had brought it about one hundred and twenty miles from the interior of the country, and that its age was about twelve months. The mother was with it, and, according to their report, stood four feet six inches in height. Her they shot, and so became possessed of her young one. During the period of his being on ship-board, in coming to England, he was very lively. He had a free range, frequently ran up the rigging, and showed great affection for those sailors who treated him kindly.

"I saw him for the first time on the 14th instant, in the kitchen belonging to the keeper's apartments. Dressed in a little Guernsey shirt, or banyan jacket, he was sitting, child-like, in the lap of a good old woman, to whom he clung whenever she made a show of putting him down. His aspect was mild and pensive, like that of a little withered old man; and his large eyes, hairless and wrinkled visage, and manlike ears, surmounted by the black hair of his head, rendered the resemblance very striking, notwithstanding the depressed nose and the projecting mouth. He had already become very fond of his good old nurse, and she had evidently become attached to her nursling, though they had been acquainted only three or four days; and it was with difficulty that he permitted her to go away to do her work in another part of the building. In her lap he was perfectly at his ease; and it seemed to me that he considered her as occupying the place of his mother. He was constantly reaching up with his hand to the fold of her neckerchief, though when he did so she checked him, saying, 'No, Tommy, you must not pull the pin out.' When not otherwise occupied, he would sit quietly in her lap, pulling his toes about with his fingers with the same pensive air as a human child exhibits when amusing itself in the same manner. I wished to examine his teeth; and when his nurse, in order to make him open his mouth, threw him back in her arms and tickled him, just as she would have acted toward a child, the caricature was complete.

"I offered him my ungloved hand. He took it mildly in his, with a manner equally exempt from forwardness and fear: examining it with his eyes, and perceiving a ring on one of my fingers,



TOMMY.

submitted that, and that only, to a very cautious and gentle examination with his teeth, so as not to leave any mark on the ring. I then offered him my other hand with the glove on. This he felt, looked at it, turned it about, and then tried it with his teeth. His sight and his ordinary touch seemed to satisfy him in the case of a natural surface; but, as it appeared to me, he required something more to assure his senses when an artificial surface was presented to him, and then he applied the test of his teeth.

"At length it became necessary for his kind nurse to leave him, and, after much remonstrance on his part, she put him on the floor. He would not leave her, however, and walked nearly erect by her side, holding by her gown, just like a child. At last she got him away by offering him a peeled raw potato, which he ate with great relish, holding it in his right hand. His keeper, who is very attentive to him, and whom he likes very much, then made his appearance, and spoke to him. Tommy—for by that name they called him—evidently made an attempt to speak, too, gesticulating as he stood, nearly erect, protruding his lips, and making a hoarse noise, 'hoo-hoo,' somewhat like a deaf and dumb person endeavoring to articulate. He soon showed a disposition to play with me, jumping on his lower extremities opposite to me, like a child, and looking at me with an expression indicating a wish for a game of romps. I confess I complied with his wish, and a capital game of play we had.

"On another occasion, and when he had become familiar with me, I caused, in the midst of his play, a looking-glass to be brought, and held it before him. His attention was instantly and strongly arrested; from the utmost activity he became immovably fixed, steadfastly gazing at the mirror with eagerness, and something like wonder depicted on his face. He at length looked up at me, then again gazed at the glass. The tips of my fingers appeared at one side as I held it: he put his hands and then his lips to them; then looked behind the glass; then gazed again at its

surface; touched my hand again; and then applied his lips and teeth to the surface of the glass; looked behind again, and then returning to gaze, passing his hands behind it, evidently to feel if there was any thing substantial there. A savage would have acted much in the same way, judging from the accounts given of such experiments with the untutored natives of a wild and newly discovered land.

"I broke a sugared almond in two, and as he was eating one half, placed the other, while he was watching me, in a little card-box, which I shut in his presence: as soon as he had finished the piece of almond which he had, I gave him the box. With his teeth and hands he pulled off the cover, took out the other half, and then laid the box down. He ate the kernel of this almond, rejecting the greater part of the sugary paste in which it was incased, as if it had been a shell; but he soon found out his error, for, another almond being presented to him, he carefully sucked off the sugar, and left the kernel.

"I then produced a wine-glass, into which I poured some racy sherry, and further sweetened it with sugar. He watched me with some impatience, and when I gave him the glass, he raised it with his hands to his lips and drank a very little. It was not to his taste, however, for he set down the glass almost as full as he had taken it up; and yet he was thirsty, for I caused a teacup, with some sugared warm milk and water, to be handed to him, and he took the cup and drained it to the last drop.

"I presented him with a cocoa-nut, to the shell of which some of the husk was still adhering: the tender bud was just beginning to push forth; this he immediately bit off and ate. He then stripped off some of the husk with his teeth, swung it by the knot of adhering husk-fibers round his head, dashed it down, and repeatedly jumped upon it with all his weight. He afterward swung it about, and dashed it down with such violence, that, fearing his person might suffer, I had it taken away. A hole was afterward bored through one of the eyes, and the cocoa-nut was again given to him. He immediately held it up, with the aperture downward, applied his mouth to it, and sucked away at what milk there was with great glee.

"As I was making notes with a pencil, he came up, inquisitively looked at the paper and pencil, and then took hold of the latter. Before I gave it up, I drew the pencil into the case, foreseeing that he would submit the pencil-case to examination by the teeth. Immediately that he got it into his possession, he put the tip of his little finger to the aperture at the bottom, and, having looked at it, tried the case with his teeth.

"While his attention was otherwise directed, I had caused a hamper containing one of the *Pythons*, or great serpents, to be brought into the room, and placed on a chair not far from the kitchen-dresser. The lid was raised, the blanket in which the snake was enveloped was opened, and soon after Tommy came gamboling that way. As he jumped and danced along the dresser toward the basket, he was all gayety and life. Suddenly he seemed to be taken aback, stopped, then cautiously advanced toward the basket, peered, or rather *craned* over it, and instantly, with a gesture of horror and aversion, and the cry of 'Hoo! hoo!' recoiled from the detested object, jumped back as far as he could, and then sprang to his keeper for protection. He was again put down, his attention diverted from the basket, and after a while tempted to its neighborhood by the display of a fine rosy-cheeked apple, which was at last held on the opposite rim of the hamper. But, no!—he would evidently have done a good deal to get at the apple; but the gulf wherein the serpent lay was to be passed, and, after some slight contention between hunger and horror, off he went, and hid himself. I then covered up the snake, and after luring him out with the apple, placed it on the blanket. No! I then shut down the lid: still the same desire and the same aversion. I then had the hamper, with the lid down, removed from the chair on which it had been placed to another part of the room. The apple was again shown to Tommy, and placed on the lid. He advanced cautiously, looking back at the empty chair, and then at the hamper: he advanced further with evident reluctance, but, when he approached near, he peered forward toward the basket, and, as if overcome by fright, again ran back, and hid himself under his cage.

"I now caused the hamper with the serpent to be taken out of the room. Our friend soon came forward. I showed him the apple, and placed it on the chair. He advanced a little, and I

patted his head and encouraged him. He then came forth, and went about the room, looking carefully, as if to satisfy himself that the snake was gone; advanced to the chair more boldly; looked under it, and took the apple, and ate it with great appetite, dancing about, and resuming all his former gayety.

"We know that there are large constricting serpents in Africa; and, as the animal must have been very young when separated from its parents, I made this experiment in particular to try his instinct: it succeeded, to the entire satisfaction of the witnesses who were present.

"He manifested aversion to a small living tortoise, but nothing like the horror which he betrayed at sight of the snake.

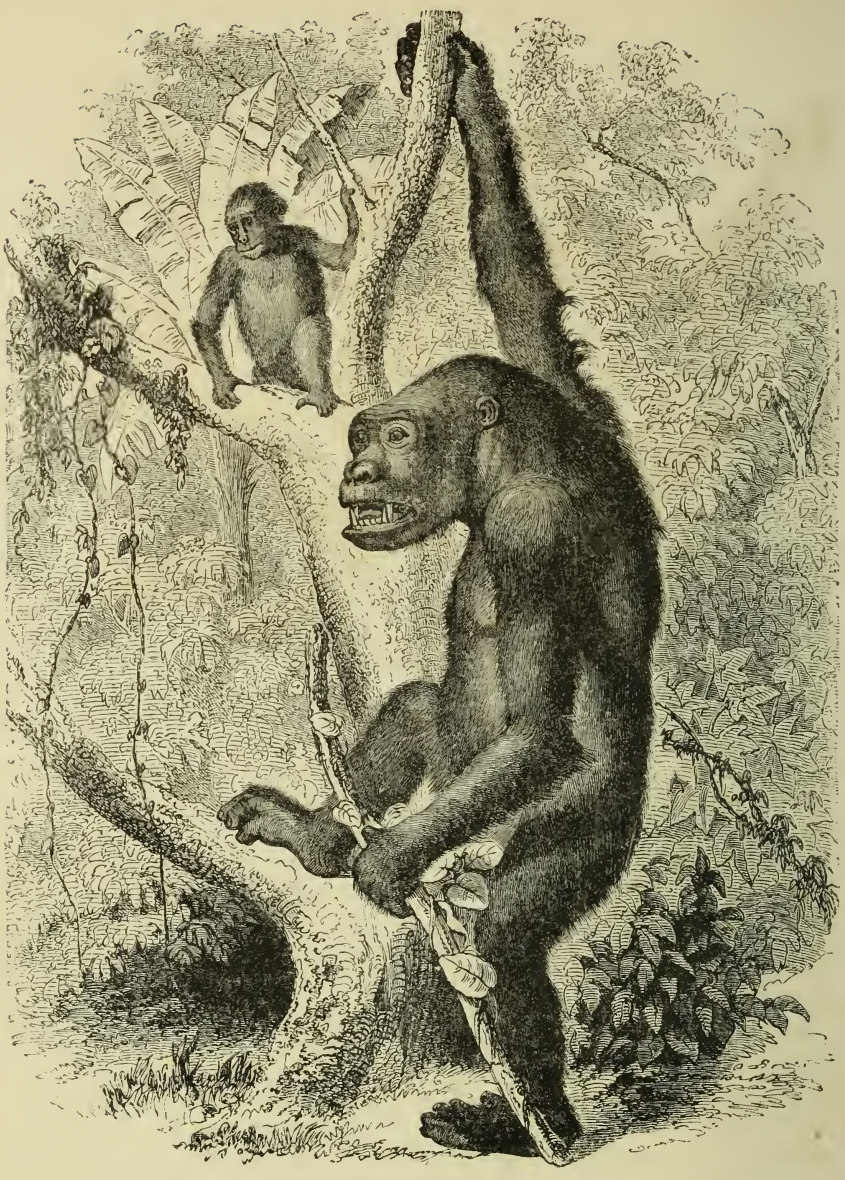
"Tommy, among other exercises, is very fond of swinging. He places himself on the swing, generally in a sitting posture, holding on each side with his hands. He not unfrequently puts up his feet, and grasps the cord on either side with them too, apparently more at home on his slack-rope than Il Diavolo Antonio himself.

"James Hunt, one of the keepers, has observed him frequently sitting and leaning his head on his hand, attentively looking at the keepers when at their supper, and watching, to use Hunt's expression, 'every bit they put into their mouths.' Fuller, the head-keeper, informs me that our chimpanzee generally takes his rest in a sitting posture, leaning rather forward, with folded arms, and sometimes with his face in his hands. Sometimes he sleeps prone, with his legs rather drawn up, and his head resting on his arms.

"Of the black orangs or chimpanzees which I have seen, Tommy is by far the most lively. He is in the best health and spirits, and is a very different animal from the drooping, sickly ones that I have hitherto seen. A good deal of observation made on the Asiatic orangs which have been exhibited in this country, satisfies me that the intelligence of the African orang is superior to that of the Asiatic. This intelligence is entirely different from that of a well-educated dog, or a mere mimic, and gives me the idea of an intellect more resembling that of a human being than of any other animal, though still infinitely below it.

"Tommy does not like confinement; and when he is shut into his cage, the violence with which he pulls at and shakes the door is very great, and shows considerable strength; but I have never seen him use this exertion against any other part of the cage, though his keeper has endeavored to induce him to do so, in order to see whether he would make the distinction. When at liberty, he is extremely playful; and in his high jinks I saw him toddle into a corner where an unlucky bitch was lying with a litter of very young pups, and lay hold of one of them, till the snarling of the mother, and the voice of his keeper, to which he pays instant respect, made him put the pup down. He then climbed up to the top of the cage where the marmosets were, and jumped furiously upon it, evidently to astonish the inmates; who were astonished accordingly, and huddled together, looking up in consternation at this 'dreadful pother o'er their heads.' Then he went to a window, opened it, and looked out. I was afraid that he might make his escape; but the words 'Tommy, no!' pronounced by his keeper in a mild but firm tone, caused him to shut the window and come away. He is, in truth, a most docile and affectionate animal, and it is impossible not to be taken by the expressive gestures and looks with which he courts your good opinion, and throws himself upon you for protection against annoyance."

The Gorilla, *Troglodytes gorilla*, is also found on the western coast of Africa, especially in the vicinity of the Gaboon. Though larger and fiercer than the chimpanzee, it appears in other respects to resemble it. The recent discovery and description of this animal has revived one of the curious legends of ancient history, which is as follows: At an era of some five hundred years before Christ, Hanno, a Carthaginian admiral, sailed out of the Mediterranean by way of the Pillars of Hercules, or Straits of Gibraltar, and founded cities on the Libyan coast. After a great variety of adventures, having proceeded as far south as the Gulf of Guinea, he came to an island in this quarter in which there was a lake, and in this lake another island, filled with savages all covered over with hair. There were a great many more females than males. The Carthaginians pursued these strange people, but they fled with precipitation, and the males, climbing up the steep rocks with astonishing agility, all escaped. Three of the females, however, fell into the hands of the invaders. These were very furious, biting and scratching, and refusing to follow their captors.



THE GORILLA.

Consequently, they were killed. Their skins being taken off, were carried to Carthage, and hung up in the temple of Saturn. Here, according to Pliny, two of them remained as late as 146 B. C., when Carthage was taken and destroyed by the Romans.

The name given by Hanno to the savages of which we have been speaking was *Gorilla*, and as it is now believed that he referred to the animal which we are describing, that title has been bestowed upon it. Our knowledge of it is yet very imperfect. This is chiefly derived from Dr. Savage, an American Protestant missionary, stationed on the Gaboon River, in Western Africa. From his account, it appears that they live on vegetables, and build huts of sticks and leaves, supported by the branches of trees. Their habits are ferocious, and instead of flying from man, as is generally the case with the chimpanzee, they boldly give him battle. They are said to utter a cry of *kha-ah, kha-ah*, sharp and prolonged. Their huge jaws open widely at each expiration: the lower



FEMALE ORANG-OUTANG.

lip hangs upon the chin. The skin is wrinkled and contracted over the eyes, which gives them an aspect of inconceivable ferocity. The killing of one of these formidable creatures is esteemed a great achievement among the negroes.

After his return to America, Dr. Savage placed several skulls and parts of skeletons which he had collected, belonging to the gorilla, in the hands of the celebrated anatomist, Dr. Wyman, of Boston, who published an interesting paper on the subject, assigning to it a place as a species distinct from the common chimpanzee, under the name we have adopted. To this distinction it is manifestly entitled by its greater size and the peculiarities in its anatomical structure.

The gorilla is known often to reach the height of six or even seven feet, and being of a fierce and ferocious disposition, is altogether the most formidable of the ape kind. We may doubt the stories of the inhabitants of the country occupied by the chimpanzee and the gorilla, as to the carrying off the negresses and holding them in bondage; but if such deeds are perpetrated, it is probably rather by the latter, the larger and more powerful species, than the former. It is highly probable that in former ages these animals were far more numerous than at present, and one may readily believe that in the age of Hanno they actually held possession of particular portions of the African coast, and exercised dominion over the elephant, the hippopotamus, and other animals. We may even suppose that they sometimes made war on the timid and feeble human inhabitants, and impressed their imaginations with such vivid terrors as to give rise to the tales alluded to.

Genus ORANG-OUTANG: *Simia satyrus.*—Of this there is but one species, which has a general resemblance to the chimpanzee, and until recently the two were confounded, one with the other. Several young specimens were carried to Europe, and upon these its character was drawn. Subsequently, much larger apes being discovered in the islands of the Indian Archipelago, inhabited by the orang, these were supposed to be a distinct species, and received the name of *pongo.* The first accurate description of the latter was furnished by the Baron de Wurmb, in a dissertation presented to the Batavian Society of Holland. Other and still more detailed accounts have since been furnished, by which it is satisfactorily proved that these are in fact true orangs, arrived at maturity.

We are in possession of full descriptions of the orang-outang. It is a native of Borneo and



THE PONGO OF WURMB

Sumatra only. Its height is about four and a half feet, though it sometimes exceeds six feet. It is covered with dark brown hair, the skin seen through it having a bluish tint. The face is nearly bare. The body is large and strong, the belly full, and the movement oscillating. The eyes are fringed with lashes; the nose is on a line with the face; the mouth is projecting; the lips thin, capable of great elongation, and endowed with a peculiar mobility; the ears small, and resembling those of man. The muzzle grows more acute with age, and the disposition of the animal often becomes fierce and savage at maturity. It is incapable of walking erect, but moves in a hobbling manner by putting the knuckles of its hands to the ground, and drawing its body forward between them. In a state of nature it probably seldom moves along on the ground—its whole configuration showing its fitness for climbing trees and clinging to the branches. In sitting on a flat surface it turns its legs under it; in sitting on a branch of a tree, it rests on its heels, its body pressed against its thighs.

The orangs generally occupy the marshy districts, covered with dense forests and rank vegetation. They are solitary in their habits, living inactive in the wilds, away from the resorts of man. During the day they move about in the upper branches of the forest; toward evening they descend and find shelter from the cold and wind in the thick foliage of the palms and other similar trees. Sometimes they make a sort of platform of sticks, and cover it with leaves, which becomes their resting-place. The old males are especially dreaded by the inhabitants, as each one appropriates a district to himself, and attacks with fury any one who invades it. Their food consists chiefly of vegetables, though they devour eggs and young birds.

The earliest detailed account of the orang-outang that we possess is given by Vosmaer, describing one brought to Holland in 1776, and presented to the menagerie of the Prince of Orange:

"This animal was in height about two Rhenish feet and a half, of a chestnut color. It showed no symptoms of fierceness or malignity, and was even of a melancholy appearance. It was fond of being in company, and showed a preference for those who took daily care of it, of which it seemed to be very sensible. Often when they retired it would throw itself on the ground as if in despair, uttering lamentable cries. Its keeper having been accustomed sometimes to sit near it on the ground, it would take the hay of its bed, and spreading it in the form of a cushion or seat, invite, by every demonstration, its keeper to sit with it. Its usual manner of walking was on all-fours, but it could also walk on its two hind-feet. One morning it got unchained, and we beheld

it with wonderful agility ascend the beams and rafters of the building. It was not without some trouble that it was taken, and we then remarked the prodigious strength of the animal; the assistance of four men being necessary in order to hold it in such a manner as to be properly secured. During its state of liberty, it had, among other things, taken the cork from a bottle of Malaga wine, which it had drunk to the last drop, and had set the bottle in its place again. When presented with strawberries on a plate, of which it was extremely fond, it was very amusing to see it take them up one by one with a fork and put them into its mouth. Its common drink was water, but it also willingly drank all sorts of wine, preferring Malaga. After eating, it always wiped its mouth, and when presented with a toothpick, used it in a proper manner. This animal lived seven months in Holland, whither it had been sent from the island of Borneo."

The following account from Dr. Clarke Abel, of one which lived some time in his possession, is additionally interesting from the circumstance of the observations having been made upon it in its own climate, while enjoying a state of comparative liberty:

"While at Java," says Dr. Abel, "he lodged in a large tamarind-tree near my dwelling, and formed a bed by intertwining the small branches, and covering them with leaves. During the day he would lie with his head projecting beyond his nest, watching whoever might pass under, and when he saw any one with fruit, he would descend to obtain a share of it. He always retired for the night at sunset, or sooner if he had been well fed, rose with the sun, and visited those from whom he habitually received food.

"On board ship he commonly slept at the mast-head, often wrapping himself up in a sail. Sometimes I preoccupied his bed, and teased him by refusing to give it up. On these occasions he would endeavor to pull the sail from under me, or force me to quit it, and would not rest until I resigned it. If all the sails happened to be set, he would hunt about for some other covering, and either steal one of the sailor's jackets, or empty a hammock of its blankets. His favorite amusement in Java was swinging from the branches of the trees, or climbing over the roofs of the houses; on board, in hanging by the ropes, or romping with the boys of the ship. He would entice them to play by striking them with his hand as they passed, and then bounding from them, but allowing them to overtake him, and then engage in a mock scuffle, in which he used his hands, feet, and mouth. If any conjecture could be formed from these frolics of his mode of attacking an adversary, it would appear to be his first object to throw him down, then secure him with his hands and feet, and then wound him with his teeth. Of some small monkeys on board he took little notice while under the observation of the persons of the ship. Once, indeed, he openly attempted to throw a small cage, containing three of them, overboard; but I had reason to believe that he was not so indifferent to their society when free from observation. On one occasion I observed him lying on his back, partially covered with a sail, contemplating with great gravity the gambols of a young monkey, which was bounding over him; at length he caught him by the tail, and tried to envelop him in the covering. The monkey seemed to dislike the confinement, and broke from him, but again renewed his gambols, and though repeatedly caught, always escaped. The intercourse, however, did not seem that of equals, for the orang-outang never condescended to romp with the monkeys as he did with the boys of the ship. Yet the monkeys had evidently a great predilection for his company, for whenever they broke loose, they took their way to his resting-place. But though so gentle when not irritated, the orang-outang could be excited to violent rage, and on one or two occasions committed acts which, in a rational being, would have been called the threatening of suicide. If repeatedly refused an orange, when he attempted to take it, he would shriek violently, and swing furiously about the ropes, then return and endeavor to obtain it. If again refused, he would roll for some time like an angry child upon the deck, uttering the most piercing screams, and then suddenly starting up, rush furiously over the side of the ship and disappear. On first witnessing this, we thought that he had thrown himself into the sea, but on searching found him concealed under the chains.

"I have seen him exhibit violent alarm on two occasions only, when he appeared to seek for safety in gaining as high an elevation as possible. On seeing eight large turtles brought on board off the Isle of Ascension, he climbed with all possible speed to a higher part of the ship than he had ever before reached, and looking down upon them, projected his long lips into the form of a

hog's snout, uttering at the same time a sound which might be described as between the croaking of a frog and the grunting of a pig. After some time he ventured to descend, but with great caution, peeping continually at the turtles, but could not be induced to approach within many yards of them. He ran to the same height, and uttered the same sounds, on seeing some men bathing and splashing in the sea, and since his arrival in England has shown nearly the same degree of fear at the sight of a live tortoise."

The same writer has given a very interesting narrative of the capture of an adult orang-outang, which was of gigantic proportions. This animal was discovered by the boat's crew of a merchant ship, at a place called Ramboom, near Touraman, on the northwest coast of Sumatra, on a spot where there were a few trees on a piece of cultivated ground. It was evident that he had come from a distance, for his legs were covered with mud up to the knees, and the natives were entirely unacquainted with him. On the approach of the boat's crew, he came down from the tree in which he was discovered, and made for a clump at some distance, exhibiting as he moved the appearance of a tall, man-like figure, covered with shining brown hair, walking erect, with a waddling gait, but sometimes accelerating his motion with his hands, and occasionally impelling himself forward by the bough of a tree. His motion on the ground was evidently not his natural mode of progression, for even when assisted by his hands, or a stick, it was slow and vacillating. It was necessary to see him among the trees to estimate his strength and agility. On being driven to a small clump, he gained by one spring a very lofty branch, and bounded from one branch to another with the swiftness of a common monkey. Had the country been covered with wood, it would have been almost impossible to prevent his escape, as his mode of traveling from one tree to another was as rapid as the progress of a swift horse. Even amid the few trees that were on the spot, his movements were so quick, that it was very difficult to obtain a settled aim; and it was only by cutting down one tree after another, that his pursuers, by confining him within a very limited range, were enabled to destroy him by several successive shots. Having received five balls, his exertions relaxed, and reclining exhausted against a branch, he vomited a quantity of blood. The ammunition of the hunters being by this time exhausted, they were obliged to fell the tree in order to obtain him; but what was their surprise to see him, as the tree was falling, effect his retreat to another, with seemingly undiminished vigor! In fact, they were compelled to cut down all the trees before they could force him to meet his enemies on the ground; and when finally overpowered by numbers, and nearly in a dying state, he seized a spear made of supple wood, which would have withstood the strength of the stoutest man, and, in the words of the narrator, broke it "like a carrot." It was stated by those who aided in his death, that the human-like expression of his countenance, and his piteous manner of placing his hands over his wounds, distressed their feelings so as almost to make them question the nature of the act they were committing. He was more than seven feet high, with a broad expanded chest, and narrow waist. His chin was fringed with a beard, that curled neatly on each side, and formed an ornamental rather than frightful appendage to his visage. His arms were long even in proportion to his height, but his legs were much shorter. Upon the whole he was a wonderful beast to behold, and there was more about him to excite amazement than fear. His hair was smooth and glossy, and his whole appearance showed him to be in the full vigor of youth and strength. This specimen is preserved in the Museum of the Asiatic Society of London.

We could add still other accounts of the orang-ontang, but these will doubtless satisfy the reader. We have seen the gorilla to figure in the history of Hanno, the Carthaginian: it appears that the orang is connected with that of Alexander of Macedon. At the present day it is confined to Borneo and the adjacent island of Sumatra; but at an earlier date it was doubtless spread over much wider territories. Strabo tells us that when the Macedonian conqueror penetrated into India with his victorious troops, he encountered a multitudinous band, which he conceived to be a hostile army. He made immediate preparations to attack this force, upon which he was informed by King Taxilla that these beings were only pacific apes, entirely destitute of the spirit of conquest. It is by no means impossible that animals of this species were spread over the tropical portions of Asia, and perhaps even the warm parts of Europe. These, in the early ages of the world, doubtless made impressions upon the vivid imaginations of the human inhabitants,



ORANG-OUTANG—OLD AND YOUNG.

which were ultimately woven by the poets into fawns and satyrs and other divinities of the field and the forest.

Genus GIBBON: *Hylobates*, or *Wood-walkers.*—These approximate the monkeys by the naked callosities on their rumps, but the absence of tails and cheek-pouches places them among the apes. They are rarely more than four feet in height, and are distinguished by their long arms, which reach the ground when they are in an erect posture. There are several species, which are found all over India and the adjacent islands, to which they are confined. The forests are their haunts, and they are rarely seen at a distance from them. Gregarious, but shy and timid, they keep up a noisy concert, resembling in this respect the Howling Monkeys of America, and some of them having guttural sacs like that tribe. In the forest the activity of certain species is great, and they make way on the trees with their long arms and lengthened feet, most rapidly; but when surprised in open, plain ground they are almost helpless. Some species appear to be more sluggish; but even these make good use of their acute eyes and ears, and are generally off before an enemy approaches near enough to capture them.



MOURNING GIBBON.

The Wou-Wou, or Active Gibbon, *H. agilis*, may be taken as an example of the genus. It has the forehead very low; orbital arches very projecting; face blackish-blue in the male, and brown in the female; in the former a white band over the eyes, which unites with the whitish whiskers; hair of the body fine, except about the neck, where it is longer, and inclined to be woolly and curled; upper part chocolate-brown; back and fore part of the thighs yellowish-brown, but the color varies a good deal, according to the sex and age—the young being paler than the adults and aged, and the very young uniformly of a yellowish-white; height about two feet seven or eight inches. This species are very agile in their habits. As soon as they reach the forest they set pursuit at defiance, swinging, leaping, and throwing themselves from tree to tree with a rapidity which seems like flying. Notwithstanding the want of the guttural sac, they howl in a manner very nearly resembling the siamang, which has one. In captivity they are not very lively—as might indeed be expected, from the impossibility of their exerting that freedom of motion on which their vivacity in a state of nature depends; but though timid they are soon reassured, take pleasure in being caressed, and become familiar and even playful. They have great curiosity, and a greedy appetite. This species is found in the forests of Sumatra, where it is named *Ungaputi*.

The Hoolock, *H. hoolock*, is little known. We are chiefly indebted to Dr. Borroughs for what knowledge we have on the subject. He has furnished a most interesting account of three individuals of the species which he had an opportunity of observing in a state of confinement. One of them, a male, showed a most amiable and docile disposition; and a young female, which died early, was equally gentle and pacific.

The Siamang, *H. syndactylus*. The animals of this species are black, and have two naked folds of skin on the neck, which are occasionally inflated. The hair is long and soft. They are very common in Sumatra, and are generally found gathered in large troops, conducted, it is said, by a chief, whom the Malays believe invulnerable. Thus assembled at sunrise, and again at sunset, they vie with each other in making the most dreadful cries, perfectly stunning to those accustomed to them, and frightful in the highest degree to strangers. At other times they appear to be perfectly quiet—so long, at least, as they are undisturbed. Among them, maternal



ACTIVE GIBBON, OR OUNGHA.

affection triumphs over every other passion, and the mother of a young one that has been wounded will immediately throw away her life in an attack on an enemy. This affection is also displayed under more pleasing circumstances; and their care of the persons of their young, by washing, rubbing, and drying them, in spite of the pettish cries and resistance of the infant siamang, is highly ludicrous and amusing.

This species is easily tamed, or rather reconciled to bondage, but unconquerably timid: it never displays the familiarity found in other monkeys, and its submission seems rather the result of extreme apathy than of confidence and affection. The siamang, in short, displays very little of the intellectual faculty, generally squatting, enveloped in its long arms, and the head brought down between the legs, in which position it sleeps. It passes the greater part of its time in sullen retirement, and seldom breaks its silence except by disagreeable cries, like those of the turkey. In confinement it takes its food with leisure and indifference: its mode of drinking is equally measured with its other habits—that is, by placing the fingers in water and then sucking them.

Mr. Bennet, in his "Wanderings," gives us an interesting account of a siamang which he kept for a time, as follows: In the cabin there was a piece of soap, which had excited the creature's cupidity, and for the abstraction of which he had been several times scolded. One day Mr. Bennet, while occupied in writing, happened to see the siamang engaged in his thievish practices. "I watched him," says the observer, "without his perceiving that I did so, though he occasionally cast a furtive glance toward the place where I sat and pretended to write. He, seeing me busily engaged, took up the soap, and moved away with it in his hand. When he had walked half the length of the cabin, I spoke quietly, without frightening him. The instant he found I saw him, he walked back again, and deposited the soap nearly in the same place whence he had taken it; thus betraying, both by his first and last actions, a consciousness of having done wrong."

The Mourning Gibbon, *H. funerus*, is a rare species, of which a single specimen was brought to Europe from the Sooloo Isles, and placed in the Garden of Plants at Paris. Here it lived for six months, displaying wonderful agility and a good degree of intelligence, but still inferior to that of the higher apes. It recognized its keeper and others who visited it frequently, and received their caresses with pleasure, but formed no attachment to any one.

There are still several other species, as the Gibbon Lar, *H. lar*, which is the Great Gibbon of Buffon, the White-handed Gibbon and Long-handed Gibbon of other authors, found in Malacca; the White-faced Gibbon, *H. leucogenys*, its country not known; the *H. concolor*, or *H. Mulleri*, of Borneo; the Ash-colored Gibbon, *H. leuciscus*, or Wou-Wou, of Camper, found in Java; the Coromandel Gibbon, distinguished by a long beard and black mustaches; Raffles' Gibbon, *H. Rafflesii*, of Sumatra, often confounded with the gibbon lar; and the *H. entelloides*, of India.







2. THE OLD-WORLD MONKEYS: CATARRHINÆ.

The terms *Ape* and *Monkey* are loosely applied, in common language, to all or either of the monkey-like species. *Ape*, however, more properly belongs to those which are destitute of tails, and *monkey* to those which have them. We now come to the Catarrhine portion of the latter division, embracing the numerous species of the Eastern Continent.

Genus SEMNOPITHECUS.—This term is derived from the Greek *semnos*, venerable, and *pithekos*, an ape—one prominent species, the Entellus, being held sacred by the Hindoos. The animals of this genus are confined to Southern Asia and the Asiatic islands. They are marked by cheek-pouches, and callosities on their haunches. The form of their body is slender and elongated: the extremities are also of great length, as in the Gibbon—the hinder ones, however, being the longest. The tails are much longer in the semnopithecs than in any of the ordinary monkeys. Though slender, these possess a very considerable degree of muscular power, and enter as an important constituent into the motions and progression of the animals. When they are at rest, the tails are allowed to hang down perpendicularly, and, from their great length, which considerably exceeds that of the animal's body, have a very droll effect, which is heightened by the air of imperturbable gravity belonging to the creatures themselves. When they are unemployed, this is their general aspect: they exhibit the very picture of sadness and melancholy, and appear as if perfectly regardless of every thing that passes around them; but when roused or excited, they are capable of the most surprising exertions, and astonish the spectator by a rapidity, variety, and precision of movements, which could scarcely be anticipated from creatures apparently so apathetic in mind and delicate in body. They are in reality far from meriting the name of *Slow Monkeys*, which some zoologists have given them. Their slowness is exhibited in disposition more than in action, and is an attribute of character rather than of structure. When young, they are readily domesticated; but being less petulant, curious, and restless than the Cercopithecs, Baboons, and some others, they



ENTELLUS, OR SACRED MONKEY.

are supposed to exhibit less intelligence; though their mental qualities, as well as their physical structure, closely assimilate them to the real apes. The old males become morose, sullen, and mischievous.

The Entellus, Hoonuman, or Sacred Monkey, *S. entellus*, the type of the genus, is of a rusty-brown color, the head and body being over two feet in length. It is a native of Bengal, the Himalayan Mountains, Nepaul, and Bootan, and is remarkably interwoven with the religion of the countries where it is found, especially among the Hindoos. These people believe that the entellus is a metamorphosed prince, and to kill one is a deadly sin. As might be expected, this treatment has been favorable to the increase of these creatures, and hence they absolutely swarm in many places, and especially in the vicinity of the temples. In some parts they are a complete pest, as they destroy vast quantities of fruit in the gardens and plantations. M. Duvaucel has given an interesting account of the careful watch which the Bengalese kept over him to prevent his killing this sacred animal, holding a high place among the thirty millions of Indian gods, and to save himself from dying within the year, which, according to popular belief, is sure to be the fate of one who puts an entellus monkey to death. He was harangued by the Hindoos upon the danger of injuring animals which were no other than princes and heroes under the operation of the metempsychosis. Unmoved by their eloquence, and eager to possess a specimen, he leveled and brought down a "princess!" But the acquisition was dearly bought. The ill-fated creature had a young one on her back, and, though shot through the heart, the mother exhausted her remains of life in throwing it into the branches of a neighboring tree, then fell and expired at the feet of her destroyer. It is but just to add, that he mourned over the deed he had done.

The following account from a late traveler in India will give some idea of the immense numbers, as well as the habits of these "sacred monkeys:"

"On another occasion," says the narrator, "in company with the assistant magistrate of the district, I started in a buggy for a morning's drive to Deobund, from which we were some twelve miles distant. We were attended by two sowars—native horsemen, or mounted police—and having a swift mare, we got over the ground at a rapid pace. When about two miles from the bungalow, we overtook a tribe of large monkeys. I should say there were as many as four hundred, and each carried a stick of uniform length and shape. They moved along in ranks or companies—just, in short, as though they were imitating a wing of a regiment of infantry. At the head of the tribe was an old and very powerful monkey, who was no doubt the chief. It was a very odd sight, and I became greatly interested in the movements of these creatures. There could



M. DUVAUCEL SHOOTING MONKEYS IN INDIA.

be no question that they had either some business or pleasure on hand; and the fact of each carrying a stick, led us to conclude that it was the former upon which they were bent. Their destination was, like ours, evidently Deobund, where there are some hundreds of monkeys fed by a number of Brahmins, who live near a Hindoo temple there, and perform religious ceremonies. They—this monkey regiment—would not get out of the road on our account, nor disturb themselves in any way; and my friend was afraid to drive through their ranks, or over any of them, for when assailed they are most ferocious brutes, and armed as they were, and in such numbers, they could have annihilated us with the greatest ease. There was no help for us, therefore, but to let the mare proceed at a walk in the rear of the tribe, the members of which, now that we were nearing Deobund, began to chatter frightfully. Just before we came to the bungalow, they left the road and took the direction of the temple. Fain would we have followed them, but to do so in the buggy would have been impossible, for they crossed over some very rough ground and two ditches. My friend, therefore, requested the sowars to follow them, and report all they might observe of their actions. Meanwhile, we moved off to the bungalow; on arriving at which, we mentioned to the proprietor, a very old but active and intelligent man, the sight we had seen on the road—the regiment of monkeys.

"'Ah!' exclaimed the old man, 'it is about the time.

"'What time?'

"'Well, Sahib, about every five years that tribe comes up the country to pay a visit to this place; and another tribe comes about the same time from the up-country—the hills. They meet in a jungle behind the old Hindoo temple, and there embrace each other as though they were human beings and old friends who had been parted for a length of time. I have seen in that jungle as many as four or five thousand. The Brahmins say that one large tribe comes all the

way from Ajmere, and another from the southern side of the country, and from Nepaul and Tirhoot. There were hundreds of monkeys here this morning, but now I do not see one. I suppose they have gone to welcome their friends.'

"The sowars who had been deputed to follow the tribe now rode up, and reported that, in the vicinity of the old temple, there was an army of apes—an army of forty thousand! One of the sowars, in the true spirit of oriental exaggeration, expressed himself to the effect that it would be easier to count the hairs of one's head than the number there assembled.

"'Let us go and look at them,' I suggested.

"'But we will not go on foot,' said my friend; 'we will ride the sowars' horses. In the first place, I have an instinctive horror of apes, and should like to have the means of getting away from them speedily, if they become too familiar or offensive. In the second place, I do not wish to fatigue myself by taking so long a walk in the heat of the day.'

"We mounted the horses, and were soon at the spot indicated by the sowars. There were not so many as had been represented; but I am speaking very far within bounds when I state that there could not have been fewer than eight thousand, and some of them of an enormous size. I could scarcely have believed that there were so many monkeys in the world, if I had not visited Benares, and heard of the tribes at Gibraltar. Their sticks, which were thrown together in a heap, formed a very large stack of wood.

"'What is this?' my friend said to one of the Brahmins; for since his appointment he had never heard of this gathering of apes.

"'It is a festival of theirs, Sahib,' was the reply. 'Just as Hindoos, at stated times, go to Hurdwar, Hagipore, and other places, so do these monkeys come to this holy place.'

"'And how long do they stay?'

"'Two or three days; then they go away to their homes in different parts of the country; then attend to their business for four or five years; then come again and do festival; and so on, sir, to the end of all time. You see that very tall monkey there, with two smaller ones on either side of him?'

"'Yes.'

"'Well, sir, that is a very old monkey. His age is more than twenty years. I first saw him fifteen years ago. He was then full-grown. His native place is Meerut. He lives with the Brahmins at the Soorj Khan, near Meerut. The smaller ones are his sons, sir. They have never been here before; and you see he is showing them all about the place, like a very good father.'

"Having at length seen enough of these 'sacred animals,' we returned to the bungalow."

It appears that the entellus is an expert serpent-killer. It will steal upon a snake when asleep, grasp it around the neck, and then run to the nearest stone, where it deliberately grinds off the reptile's head till his poisonous fangs are destroyed. This monkey seems to be a humorist, as he is said frequently to take a quizzical look at the serpent during this process, and to grin with satisfaction at his impatient writhings. When its victim is rendered harmless, the monkey throws it to his young ones, who amuse themselves by tossing it about, like a parcel of children, until it is quite dead, and its convulsions can afford no further amusement.

The pythons, which multiply in numbers, and grow to an enormous size in tropical countries, are great destroyers of monkeys. Winding and stealing with a noiseless progress among the branches of the trees, they suddenly dart upon these animals, and crush them in their folds. Alike by instinct and experience, the monkeys have a horror of these creatures, and usually fly at their approach. Sometimes, however, they attack and kill them. Mr. Owen, when in the forests of India, on a certain occasion, heard a great hubbub among a party of monkeys over his head. Pretty soon a python, six or seven feet long, fell to the ground, nearly dead from the bites that had been given him by the monkeys.

The Budeng, *S. Maurus*, has a long body, broad and robust about the shoulders; the upper part of the face nearly naked; the callosities large and rough; tail the length of the body. There are two species—one black and one red—the latter being called Lutung, *S. Pyrrhus*. Both are found in Java and Sumatra. Dr. Horsfield tells us that the budeng is found in abundance in the extensive forests of Java. It forms its dwellings on trees, and associates in numerous societies.



THE KAHAU, OR LONG-NOSED MONKEY.

Troops, consisting of more than fifty individuals, are often found together. If a person meets them in the forests, it is prudent to observe them at a distance. They emit loud screams on the approach of man, and by the violent bustle and commotion excited by their movements, branches of decaying trees are not unfrequently detached, and precipitated on the spectators. They are often hunted by the natives for the purpose of obtaining their fur. In these pursuits, which are generally ordered and attended by the chiefs, the animals are attacked with cudgels and stones, and cruelly destroyed in great numbers. The skins are prepared by a simple process which the natives have acquired from the Europeans, and they conduct it at present with great skill. It affords a fur of a jet-black color, covered with long silky hairs, which is usefully employed both by the natives and Europeans in preparing riding equipages and military decorations. The budeng, during its young state, feeds on tender leaves of plants and trees; and when adult, on wild fruits of every description, which are found in great abundance in the forests which it inhabits.

The Kahau, or Proboscis Monkey, *S. nasalis*, or *S. larvatus*, is chiefly distinguished by its enormous nasal organ, which gives it a ludicrous resemblance to a large-nosed old man. This protuberance is of a flabby substance, and is capable of being enormously inflated. The form of the body is stout, the length being about three feet. The general color is reddish-brown. This species is a native of Borneo, and would seem sometimes to be found in Southern India. As there is no part of the world more rich in animal curiosities than this, so the kahau among these is one of the most extraordinary. Figure to yourself an old man three feet and a half high, with a bent back, an aspect of decay, and a crabbed look, yet possessing all the petulance and vivacity of youth, and you have the portrait of one of these eccentric creatures. You must add, however, a nose six inches long, and black as a coal, in order to render the image complete.

Mr. Adams gives us the following additional sketch, including a portrait of the gentler sex: "When excited and angry, the female of this species resembles some tanned and peevish hag, snarling and shrewish. When walking on all-fours, they often raise themselves upright and look about. When they sleep, they squat on their hams, and bow their heads on the breast. When disturbed, they utter a short, impatient cry, between a sneeze and a scream: when they emit this wheezing, hissing sound, they twist and wrinkle the nose, and open the mouth wide."



THE TRUE COLOBE: COLOBUS VERUS.—(See p. 82.)

These creatures live in large companies in the forests, along the banks of rivers, where it is their custom to make an excursion, morning and evening, bounding, chasing, frolicking, and giving themselves up to the most tumultuous sport. Their constant noisy outcry of *Kahau*, *kahau*, frequently attracts the hunter, and results in their destruction. Their disposition is savage and mischievous.

The Dyacks declare that this monkey is a human being that lives retired in the woods in order to avoid taxation. M. Geoffroy tells us that a short time before the French revolution of 1789, Tippoo Sahib's ambassadors at Paris were greatly delighted at seeing one of these creatures in the Garden of Plants, whom they recognized as a countryman, and to whom they imputed a high moral and mental intelligence. Napoleon insisted that a big nose was evidence of talent in a man, and Tippoo's diplomats evidently thought the rule applicable to monkeys.

The Douc, *S. nemæus*, is a native of Cochin China, and is noted alike for its vivacity and the striking contrasts in the color of its fur, the upper part of its body being gray, speckled with black; the thighs and fingers, black; the legs and tarsus of a bright russet; the fore-arms, thumb, lower part of the legs, haunches, and tail of a pure white. These animals live in large troops, and are of inoffensive habits, if not molested.

The preceding are the best known and most interesting species of Semnopithecs. Many others, however, are described by naturalists, among which are the White-rumped Monkey of Ceylon, *S. leucoprymnus;* Dussumier's Monkey, of Malabar, *S. Dussumieri;* the Hooded Monkey, also of Malabar, *S. cucullatus;* the *S. obscurus*, of Malacca; the White-footed Monkey of Manilla, *S. albipes;* the Snowy Monkey, *S. pruinosus;* the Negro, or Tchincou Monkey, of Java, *S. Maurus?* the Crested Monkey of Sumatra and Borneo, *S. cristatus;* the Femoral Monkey of Borneo, *S. femoralis;* the Golden Monkey of Java and the Moluccas, *S. auratus;* the Crowned Monkey, *S. frontatus*, the *S. rubicundus* of Schlegel, and the Gold-haired



MALBROUCK : GENUS CERCOPITHECUS.—(See p. 88.)

Monkey, *S. chrysomela*, all of Borneo; the Black-crested Monkey, *S. melalophos*, and the Yellow-handed Monkey, *S. flavimanus*, of Sumatra; the Siam Monkey, *S. Siamensis* of Muller, or Black-handed Monkey, *S. nigrimanus* of Geoffroy, found in Siam and Southern Asia; and the Mitered Monkey of Java, *S. comatus*, called *Croo* by the natives.

Among these numerous species there are certain distinctions of structure which have led some naturalists to range them under different divisions. They are, however, so nearly allied as to render them a natural and homogeneous group in the great and diversified family of monkeys.

Genus COLOBE, *Colobus*.—The monkeys of this genus are almost destitute of thumbs on the anterior limbs, and hence their name, derived from the Greek, *kolobos*, mutilated. They resemble the preceding in their intelligence and in their habits, living like them in forests and feeding upon vegetable substances. The known species all belong to Africa.

The Guereza Monkey, *Colobus Guereza*, is found in Abyssinia, and is distinguished for the beauty of its skin, the greater part of the body being black; its forehead, and a circle around the face, with the sides, neck, and throat, are pure white. A sort of mantle of long white hair starts from the sides, near the back, and descends in flowing masses along the after part of the body.

These animals live in small families, dwelling in the tops of large trees in the neighborhood of flowing waters. They are exceedingly nimble and lively, without being boisterous. They feed on fruits, grain, and small insects. The inhabitants of some parts hunt them, and it is a mark of distinction among the soldiers to possess a shield covered with the skin of this monkey, displaying the full flying mantle we have described.

The *Colobus polycomos* of Sierra Leone goes by various names, as King of the Monkeys, Bear Monkey, Full-bottomed Monkey, &c. The color is generally black, tinged with yellow on the fore parts. The hair of the head is long, and falls in such a manner as to appear like a camail—a small cloak, covering the upper part of the body; hence the French call this animal *C. à camail*.

The other species of this genus are the *C. satanas*, of the island of Fernando Po; the Furred Monkey, *C. vellerosus;* the Bay Monkey, *C. ferrugineus*, of Sierra Leone; the *C. fuliginosus*, of Senegambia; and the True Colobe, *C. verus*, of Western Africa.

Genus CERCOPITHECUS.—This term is derived from the Greek *kerkos*, the tail, and *pithekos*, an ape. The genus embraces the *Guenons* of French naturalists. Nearly thirty species are known, all belonging to Africa. They are distinguished from the genus Semnopithecus by a less slender form, a longer face, and larger cheek-pouches, in which they often preserve their food for a time. They are between one and two feet in length, and are generally marked by a certain elegance of form. They are covered with fine hair, and this is often distinguished for the brilliancy of its color. The tail is generally the length of the body, and carried over the back. They do not

lack intelligence, but they are variable, and often petulant. The term *Cercopithecus*, meaning *Tailed apes*, is derived from the ancients, and is supposed to have a certain propriety, as these approach the apes more nearly than any other monkeys in the shortness of the muzzle.

It is probably to some species of cercopithecus that Ludolf refers in his history of Ethiopia, in the following amusing description:

"Of apes," he says, "there are infinite flocks up and down in the mountains—a thousand and more together: there they leave no stone unturned. If they meet with one that two or three cannot lift, they call for more aid, and all for the sake of the worms that lye under—a sort of dyet which they relish exceedingly. They are very greedy after emmets. So that having found an emmet-hill, they presently surround it, and laying their fore-paws with the hollow downward upon the ant-heap, as fast as the emmets creep into their treacherous palmes, they lick 'em off with great comfort to their stomachs: and there they will lye till there is not an emmet left. They are also pernicious to fruit and apples, and will destroy whole fields and gardens, unless they be carefully looked after; for they are very cunning, and will never venture in till the return of their spies, which they send always before, who giving information that all things are safe, in they rush with their whole body, and make a quick dispatch. Therefore they go very quiet and silent to their prey; and if their young ones chance to make a noise, they chastise them with their fists; but if they find the coast clear, then every one hath a different noise to express his joy. Nor could there be any way to hinder them from further multiplying, but that they fall sometimes into the ruder hands of the wild beasts, which they have no way to avoid but by a timely flight, or by creeping into the clefts of the rocks. If they find no safety in flight, they make a vertue of necessity, stand their ground, and filling their paws full of dust or sand, fling it full in the eyes of their assailant, and then to their heels again."

The Patas or Red Monkey, *C. ruber*, is one of the species best known, and is mentioned in the writings of the earliest naturalists. Like the rest of its genus, it has the head rounded, the nose flat, the nostrils opening in grooves; cheek-pouches outside of the teeth; naked callosities on the haunches. The body is seventeen inches long; the upper part of the form of a bright reddish fawn-color. The face is marked by a black band, which appears like eyebrows. It is a native of Senegal.

This is a very active and lively species, darting about, while in confinement, in a very peculiar manner. It is exceedingly irascible, and is liable to do mischief, if provoked. It inhabits a country where there are detached trees, and in walking from one to the other, though its motions are leaping and inelegant, it progresses with tolerable celerity.

The Varied Monkey, *C. mona*, has been celebrated for its beauty. The top of the head is of a greenish yellow, with a tinge of black; the cheeks are of a bluish purple. The lips and part of the chin are without hair, and flesh-colored. On the sides of the face are large bushy whiskers of a yellowish tinge. The neck, back, and sides are deep chestnut brown; the lower parts are of a slaty hue. The under surface of the body and the inside of the limbs are pure white. Altogether, this creature is a fop of the first order. It is a native of the Atlas Mountains, in Northern Africa, and hence, from its colder climate, it is more hardy than most other monkeys.

It is naturally timid in its wild state, rarely approaches inhabited regions, and never enters the plantations. In a time of famine—that is to say, when fruits become scarce in the forests—they descend in troops upon the plains, and there they turn over the stones with the zeal of entomologists to collect the insects found beneath them. Unlike the naturalists who chase after flies, they do not use a box, with pins, but the two bags provided for them by nature, which are placed by their mouths on each side, under the cheeks. These membraneous pouches are so large in the mona, that it can contain provisions for two days.

It is docile in its nature, and is capable of considerable education in a domestic state. It is addicted to cunning, and is a most expert pickpocket, when it has had lessons among mankind. It learns to turn keys and rob drawers of their contents with a slyness and dexterity altogether wonderful. It readily learns to play various tricks, and if conciliated by kindness, shows strong attachment. On account of these various gifts and recommendations, qualified only by the pardonable fact that it gets cross as it grows old, the mona monkey has been more frequently a favorite than almost any other species.



THE VARIED, OR MONA MONKEY.

The following interesting account of one of this family is furnished by the keeper of the Garden of Plants, Paris:

"Contrary to the usual custom of monkeys, the mona makes no grimaces, and she has an expression of mildness and gravity of countenance quite extraordinary. She eats willingly of every thing offered to her—cooked meat, bread, fruits, and some species of insects. She is particularly fond of ants and spiders, which she eats in the manner of an epicure. Her agility and rapidity of motion are remarkable, yet she is always gentle and graceful. She is very tenacious in her desires, but she is never violent; and when she has solicited an object that she is very anxious to obtain for a length of time, if she is still refused, she suddenly ceases her importunity, turns head over heels, and seems to think no more about it.

"She is not very particular in her ideas of property. She has, in fact, such a fancy for pilfering, that no correction bestowed upon her is of any avail against it. When any one caresses her, she slips her hand quietly into his pockets, and takes out its contents with the skill of a regular thief. If she wishes to take bonbons or fruit out of a closet, she turns the key without making any noise, and has often been seen to untie a parcel.

"There can be nothing more amusing than the face of this monkey when her cheek-pouches are full. Her head looks double the usual size, resembling very much the puffed and bloated countenances drawn by the old painters to represent the winds. When she wishes to empty her provision-bags, she slily leaves her companions, and seeks a tree standing apart, and sufficiently umbrageous to hide her in the foliage; for she fears that her associates, seeing her so well stocked with provisions, may, as sometimes happens, attack and beat her to make her open her mouth. In her hiding-place, tranquilly seated in the fork of a branch, she delivers the insects, one by one, from her pouch, looks at them eagerly, skins them with her little fingers, breaks off and throws away their wings and claws, then touching them with her teeth several times in a gastronomic manner, she finally eats them with the greatest satisfaction. She then recommences the operation, until her provisions are exhausted, when she rejoins her friends."

The Diana Monkey, *C. Diana*—the *Roloway* of the French. This animal received its title of Diana from Linnæus, on account of a fancied resemblance in the coronet-shaped bow which ornaments its brow, to the silver bow of the goddess. Its body is variously marked with black, white, gray, yellow, and reddish-brown. The length of the form is sixteen inches, and the tail two feet. It is found in large troops in the deep and silent forests of Congo and Guinea. In a savage state, they feed on fruits and the eggs of birds and insects. As they are easily tamed, the negroes catch them in numbers, and sell them to the Europeans who trade upon the coast of Africa. M. Boitard gives us the following:

"The character of the roloway is very gentle. It becomes very fond of its master, will follow him wherever he goes, and will allow itself to be taken without difficulty. A friend of mine had



DIANA MONKEYS

one that was very affectionate, which accompanied him often from the city to his country-house, a distance of nine miles. The road was bordered with trees, and as she was very curious, she climbed up every one to see what she could find. When the trees were quite close together, she jumped from one to the other with a rapidity and lightness truly remarkable. But this soon became fatiguing, and then she bethought herself of making a horse of a little spaniel. The first time she mounted upon him, the dog was terribly alarmed, and tried to shake off the unwelcome intruder. But she seized his long hair with her fore-paws, and clung to him in such a manner that neither running, jumping, nor turning round was of any use. When he tried to get her off by rolling over upon the earth, or in a ditch, she jumped lightly to the distance of a few paces, sat down, and observed him; but the moment he rose up again, with another jump she seated herself on his back. At last, the poor dog, weary of so useless an opposition, resigned himself to his fate, and, philosopher-like, making a virtue of necessity, became the constant servant of the wilful roloway.

"Good and affectionate as was this little animal, she went frequently into violent fits of anger, which, however, were generally caused by fear. For instance, if she accidentally broke a glass tumbler, or a porcelain cup, she immediately fell into a furious passion, and screamed violently, expecting a correction, which, however, she did not often receive.

"Like the mona, she was a little thievish, and had the habit of hiding what she stole in the beds and between the sheets. She often slid into the poultry-yard, and taking an egg in each fore-paw, ran off upon her two hind-legs, presenting in this attitude a most grotesque appearance. She was very fond of raw eggs. She would take one and strike the end gently upon a pane of glass to break the shell; she would then enlarge the hole a little with her finger, put it to her mouth, and suck out the contents with laughable satisfaction. She was very fond of coffee, and each time that she succeeded in entering the kitchen, she looked into the coffee-pots to eat the grounds that remained within them. She loved strong liquors, but in a peculiar way; for she did not drink them, but used them as perfumes, dipping her paws into them, and then rubbing over the whole of her body. Would that the example of this little quadruped might be followed by mankind!

"She ate of nearly every thing that came within her reach—cooked meat, bread, little birds when they were given her alive, fruit, sugar-plums, bonbons, &c. She used a stone to crack her nuts and almonds with, and showed in most things wonderful intelligence. There is, however, one fact which proves how little memory the creature possesses, and how it acts without reflection. When a candle was placed on the table in the evening, she immediately approached, and fancying the flame of the candle was something good to eat, she reached her head out and touched it with her tongue. She burned herself of course, and shrieking piteously, ran away in terror; but all



THE DIADEM MONKEY.

this sad experience was lost upon her, as the next day, if tempted in the same manner, she was sure to commit the same foolish act.

"When she was first purchased, the character of this animal was very mild. She had been in captivity three years, and as she grew old, it was easy to see that she became mischievous and cruel. She made a poor cat that belonged in the house with her, the victim of her cruelty. She carried or dogged her round everywhere she went, caressing and beating her by turns. She would sometimes fill her mouth with raisins and pieces of apple, and by means of blows and violence forced poor pussy to swallow a nourishment that was distasteful to her. In short, she at length caused her death by abuse and violence. After that time she was not permitted to tyrannize over any other living animal."

The White-eyelid Monkey.—This animal is doubtless of the genus Cercopithecus, though Buffon called it a Mangabey, and M. Geoffroy St. Hilaire denominates it *Cercocebus fuliginosus*. It is probably a native of Western Africa. Its general color is a grayish black. It is not deficient in intelligence, and can be taught various tricks. It is petulant and capricious in captivity, but otherwise is well-behaved. A specimen in the London Zoological Gardens was remarkably active, and caused great amusement by its grimaces, to which its countenance gave peculiar effect.

The Collared White-eyelid Monkey, *C. Ethiops* of Geoffroy, resembles the preceding in its character and in its general color, though it is marked with chestnut brown upon the upper part of the head, and the fore part of the neck is crossed with a band of pure white. It has also long white mustaches. It appears to be a native of Western Africa.

The Talapoin, *C. talapoin*, is a well-known species from Western Africa, and is a favorite, on account of its gentle character, its intelligence, and its small size. The general color of the body is green above and white below.

The Diadem Monkey, *C. diadematus*, is nearly black, the lower parts being mottled with green. It is marked with a circular white spot upon the forehead, from which it derives its name.



THE WHITE-NOSED MONKEY.

The White-nosed Monkey, *C. nictitans*, is sometimes called the *Hocheur*, and was denominated the *Long-nosed Guenon* by Buffon. The nose is not only white, but is more prominent than in most monkeys. Its general color is black, spotted with olive. It is a native of Guinea.

The Lesser White-nosed Monkey, *C. petaurista*, has a very flat nose, but still marked with a distinct spot of white at the extremity. The general color is brown, mixed with gray, deeper on the back and tail and the outer sides of the limbs; the hands are nearly black. It is a very small species, the body being only ten or twelve inches long, and the tail half as much again. It is a native of Guinea, and peculiarly sensitive to cold. A specimen in the London Zoological Gardens was lively and good-tempered, very shy and anxious to conceal its form, and kicking and crying out if handled for inspection.

The Grivet, *C. grivet*, is from the upper regions of the Nile, and was known to the ancient Egyptians as well as the Greeks. Its size is small, and its color a greenish gray. It is supposed by some authors to be the animal spoken of in the Bible, 2 Chronicles, ix. 21: "For the king's—Solomon's—ships went to Tarshish with the servants of Huram: every three years once came the ships of Tarshish bringing gold and silver, ivory, and *apes*, and peacocks." Others suppose the ape referred to was the magot. There is little doubt that the grivet is one of the monkeys represented on the Egyptian monuments.

The Green Monkey, or Callitrix, *C. sabæus*, a well-known African species, is of a greenish-yellow color, the body about sixteen inches long. Adanson, in his travels in Senegal, gives an account of these animals in their native state, as follows:

"I perceived the monkeys only by the branches which they broke from the tops of the trees to throw down upon me; for they were so light and silent in their movements, that it was difficult to hear them. I first shot one and then another, without their seeming at all alarmed. However, when most of them were killed or wounded, the rest began to shelter themselves: some of them by hiding behind the large branches; others by descending to the earth; others still, and by far the greater number, jumped from one tree to another. I continued to fire upon them, and killed twenty-three in less than half an hour, and within a short space. During this time they



THE SOOTY MONKEY.—(See p. 89.)

did not utter a single cry, although they several times assembled together in groups, frowning and grinding their teeth, and evidently preparing to attack me."

It is to be regretted that they did not inflict some chastisement upon this wanton and shameless monkey murderer.

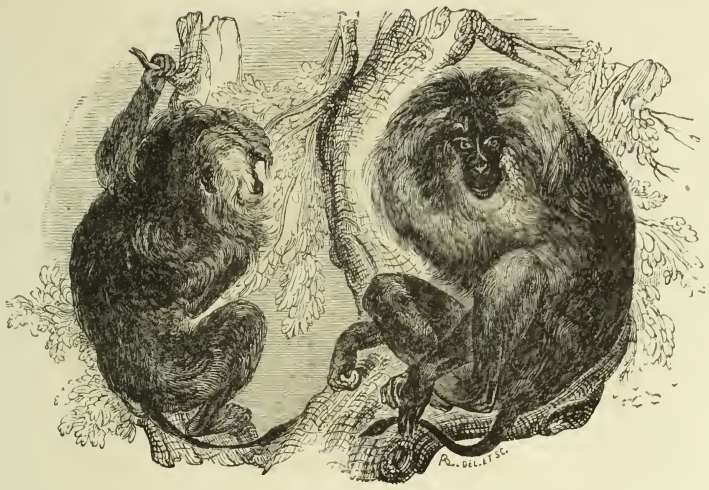
The MALBROUCK, *C. cynosurus*, is an African species, and is of a grayish-green hue, with a white band on the forehead. Like other monkeys, it inhabits the forests and lives almost exclusively amid the branches of trees, where it unites in troops, and with the birds seems to hold a constant revel of sport and gayety. It is extremely irritable, and is wary and subtle in its revenges, making a sudden attack when not observed. It uses its hands with great address to eat, play, or fight; it seizes small objects with infinite dexterity between the thumb and short fore-finger, and readily peels the fruit on which it feeds, with its teeth. All its senses, and especially the sight, seem to be very perfect.

The NISNAS MONKEY, *C. pyrrhonotus*, found in Nubia, has been deemed by some naturalists only a variety of the *Red Monkey;* but is doubtless a distinct species, being stouter than the *C. ruber*, and somewhat differently marked. It is figured on the ancient monuments of Memphis.

The MUSTACHED MONKEY, *C. cephus*, has been long known and often described. It bears a great resemblance to the mona, save that its skin is differently marked in its colorings. It is a soft and gentle creature in its manners, and is exceedingly fond of being caressed.

Other known species of this genus are the WHITE-LIPPED MONKEY, *C. labiatus*, found in Port Natal; the ROLOWAY or PALATINE MONKEY, *C. roloway*, found in Guinea, and often confounded with the Diana monkey; the BEARDED MONKEY, *C. Pogonias*, found in Fernando Po; the RED-EARED MONKEY, *C. erythrotis*, found in the same locality; CAMPBELL'S MONKEY, *C. Campbelli*, found in Sierra Leone; MARTIN'S MONKEY, *C. Martini*, and TEMMINCK'S MONKEY, *C. Temminckii*, found in Guinea; the WHITE-THROATED MONKEY, *C. albogularis*, said to be found in Madagascar, though without sufficient proof; the VERVET MONKEY, *C. pygerythrus*, found in Africa, yet its locality unknown; BURNETT'S MONA, *C. Burnettii;* the RED AND GREEN MONKEY, *C. rufo-viridis*, probably of Western Africa; and WERNER'S MONKEY, *C. Werneri*, greatly resembling the preceding. To this list we must add DELALANDE'S MONKEY, *C. Delalandii*. The celebrated *Kees*, of which the African traveler Levaillant has given such exceedingly curious and interesting details, was probably of this species. This intelligent animal, attending its master during his expeditions in the wilderness, was accustomed to hunt for roots, which he dextrously drew out of the ground. He also climbed the trees and ranged among the rocks, for the purpose of discovering honey. His fidelity was not, however, equal to his skill, for he often slily devoured what he found before his employer could take possession of it.

Genus MANGABEY, *Cercocebus*, from the Greek *kerkos*, the tail, and *kebos*, a species of monkey.



THE WANDEROO MONKEY, OR NIL BANDAR.

The monkeys of this genus, sometimes arranged with the Macakes, resemble the Guenons, which we have described; they are, however, somewhat heavier in their form. They are of about the same size, and, like them, confined to Africa. Their name of *Mangabey* was given by Buffon, who imagined that they were found near Mangabey, in Madagascar.

The Sooty Monkey, *C. fuliginosus*, has the upper parts of the body generally of a smoky gray; the lower parts white. F. Cuvier, who had seen some of them in confinement, describes them as docile and familiar, though often petulant. Constantly in motion, they assumed every variety of attitude, sometimes the most grotesque. In their incessant and vivacious leaps, they grinned constantly, as in a ludicrous laugh, always showing their long incisor teeth. The females were more calm and affectionate than the males. M. Is. Geoffroy considers the animal which had been called the Great White Monkey—the *C. atys* of some authors—a specimen of which was in the Garden of Plants, as an albino of the *C. fuliginosus*.

The White-crowned Monkey, *C. œthiops*, its locality not ascertained, and the White-collared Monkey, *C. collaris*, are the other best-known species of this genus.

Genus MACACUS.—This term is said to be derived from the negroes of Congo, who denominate a species of monkey by the name of *Macaco*. It seems to have been applied to an Asiatic species by Buffon through mistake. The genus has been the theme of dispute with naturalists, but it is now recognized as including several well-defined and distinct species. Their characteristics are a thick, bony arch over the eyes, an elongated snout, nostrils opening obliquely on the upper part of the muzzle, and the canine teeth strong and large. Some of the species are distinguished by crests or manes. They seem to approach the baboons. Swainson calls them *Ape-baboons;* and Pennant, the *Lion-tailed baboons*. Gervais divides them into three kinds, according to their tails—some being as long as the body, some middling, and some short.

The Wanderoo Monkey, *M. silenus*, has its hair deep black throughout, with the exception of the long beard or mane, which descends on each side of the face in the form of a ruff, extending downward over the chest, and varying from an ash gray to a pure white. The upper part of the face between the eyes is naked and flesh-colored; the muzzle perfectly black; cheek-pouches large; callosities of considerable size, and flesh-colored; tail about half as long as the body, and when perfect, which in captivity is not often the case, terminating in a brush of tufted hairs. It is an inhabitant of the peninsula of India and Ceylon. M. Duvaucel saw the animal in the menagerie at Barracpore, and states that the Indians give it the name of *Nil Bandar*. It lives in the depths of the solitary forests, and feeds on leaves and vegetables. A young female in the Paris Garden of Plants was gentle and affectionate, but some males were very mischievous. Father Vincent Maria gives the following quaint account of this species: "There are found four sorts of



THE MAGOT, OR BARBARY APE.—(See p. 92.)

monkeys on the coast of Malabar; the first is quite black, with glossy hair and a white beard round the chin, measuring rather more than a palm in length. The other monkeys pay to this so profound a respect, that they are humble in his presence, as though they appreciated his superiority. The princes and mighty lords hold him in much estimation for his endowments of gravity, capacity, and the appearance of wisdom above every other monkey. He is readily trained to enact a variety of ceremonies and affected courtesies, which he goes through with so grave a face and so perfectly, that it is a most wonderful thing to see them so exactly performed by an irrational creature."

The general posture of the species is on all-fours or seated, in which positions it generally takes its food, either by the hands or by bringing the mouth to it. Its first operation in feeding is generally to fill the cheek-pouches. It sleeps either on its side or sitting, bent forward, and with the head on the breast. In captivity they have exhibited varied temperaments. One in England was all life, spirit, and mischief, while another was melancholy and staid in its deportment; and yet the health of both these animals appeared to be equally good, nor was there much difference in their ages. Its usual length is eighteen inches.

The wanderoo was known to the ancients, and is supposed to have been first made known to Europe by the conquests of Alexander. Ctesias had previously spoken of "a race of men inhabiting the mountains of India, having heads like dogs, but with larger teeth. They also have nails, but larger and more rounded. They bark, but do not talk: they have tails like dogs, but more hairy." These are supposed to have been wanderoo monkeys, it not being difficult in an ignorant age, when every thing remote and strange is exaggerated, for the common rumor to convert these creatures into men.

Buffon's Macacus, *M. cynomolgus*, is also the *Egret Monkey* of Buffon and Daubenton, and is a native of India, Borneo, Java, Sumatra, and some of the adjacent isles. The hair of this animal is short, of a brown olive, spotted with black on the body, and gray on the lower parts. It is about eighteen inches in length, and is strong and robust, bearing the winter of a temperate climate better than most monkeys. Nevertheless, in the museums of Europe, like nearly all the species of this great four-handed family, it often dies early from pulmonary consumption. In confinement it is usually discontented, and of filthy moral and physical habits. Though not deficient in intelligence, such are the force and brutality of its passions that little education can be bestowed upon it. Nevertheless, some of the females have produced in captivity, though frequently they have taken no care of their offspring. In other cases, the young ones have remained attached to the breast of the mother for several weeks, she leaping and climbing about as if not thus encumbered. When the infant is a little older, it is permitted to try walking, yet the parent always



BUFFON'S MACAKE.

taking the most vigilant care of it. This tender solicitude of maternity in so coarse a brute is still admirable.

The MUNGA, or CHINESE BONNET MONKEY, *M. sinicus*—*Simia sinica* of Linnæus—is a native of India, has a long, naked, wrinkled face of a livid flesh-color, with a mass of long hairs, like the rays of a circle, above its head. The general color of the body is a greenish gray. It is found in Southern India, where popular superstition bestows upon it the same privileges as are enjoyed by the entellus monkey in Bengal. The priests believe and teach that some dozen god-monkeys, which figure in their theogony, will inflict the direst vengeance on those who happen, even by chance, to kill one of these brutes. Hence they multiply to an enormous extent, and become a pest to mankind, plundering the gardens of fruit and making sad havoc in the sugar plantations. The inhabitants of the towns and villages are obliged to build trellises to keep them out of their houses. The old authors tell us that these creatures watch the natives who tap the palm-trees in order to get the juice, of which they make a favorite beverage called *zari*. When the people are gone, the monkeys come and drink the sap which has collected in the vases. This, however, intoxicates them, and thus, having lost their wits, they are easily captured. This story needs confirmation.

The monkey we have been describing is the *Toque* of some French authors, which, although it has been considered a distinct species, is identical with the Chinese bonnet monkey, or at most a variety of that species. The two are of the same locality and habits, with only accidental distinctions.

The BLACK-FACED MONKEY, *M. carbonarius*, found in Sumatra, is held by some naturalists to be the same as the preceding, which it resembles.

The MAIMON, or PIGTAILED MACAKE, *M. nemestrinus*, is a large and robust animal, of a savage disposition, found in Borneo and Sumatra.

Besides these species, there are the *Macacus aureus* of Bengal and Sumatra; the TAWNY MONKEY of Pennant, *Simia mulatta*, perhaps only a variety of the *M. aureus; M. Philippinensis*, which is white, and probably an albino of some of the species we have described; the SHORT-TAILED MONKEY, *M. erythræus*, found in Continental India; the URSINE MACAKE, *M. ursinus*, of Cochin China; and the RED-FACED MACAKE, *M. speciosus*, of Japan.



THE BLACK MACAKE.—(See p. 93.)

Genus MAGOT: *Magus—pithecus* of the ancients. The magots greatly resemble the macakes, the chief difference being that the former have only a rudimental tail, two or three inches long.

The MAGOT, *Magus sylvanus*, or *Macacus inuus*, called the *Barbary ape*, is the only species of the genus. It is about eighteen inches long; its head is large, its snout large and long, its nose flat, its face and ears of a livid flesh-color, its body thick, and its limbs well knit. Its cheek-pouches are capacious, and its teeth large and strong. The upper parts are of a golden yellow, traversed by slight black bands; the lower are yellowish gray. It is a native of Barbary, and is among the most robust of the monkeys, bearing transportation to temperate climates with little injury. It is one of the monkeys most commonly taken to Europe, and is an indispensable accompaniment of perambulating menageries. Its turn for mimicry is well known.

Caubasson relates a laughable anecdote of one of these animals, which he brought up tame, and which became so attached to him as to be desirous of accompanying him wherever he went: when, therefore, he had to perform divine service, he was under the necessity of shutting him up. One day, however, the animal escaped, and followed the father to church, where, silently mounting on the top of the sounding-board, above the pulpit, he lay perfectly quiet till the sermon began. He then crept to the edge, and overlooking the preacher, imitated his gestures in so grotesque a manner that the whole congregation were unavoidably excited to laughter. Caubasson, surprised and displeased at this ill-timed levity, reproved his auditors for their inattention; and on the obvious failure of his reproof, he, in the warmth of zeal, redoubled his actions and his vociferations. These the ape so exactly imitated, that all respect for their pastor was swallowed up in the scene before them, and they burst into a loud and continued roar of laughter. A friend of the preacher at length stepped up to him, and on pointing out the cause of this improper conduct, it was with the utmost difficulty he could command a serious countenance while he ordered the ape to be taken away.

In their native state, the magots are among the liveliest and most intelligent of monkeys. They have the wit and courage to frighten and in some degree to command the huger animals of the forest, as the elephant and rhinoceros, by pursuing them with hideous cries and throwing down branches of trees upon them. When living near the abodes of man, they make great depredations by stealing the fruit. When engaged in their thefts, they station sentinels on high places, which give the alarm by loud cries, in cases of danger. Their most dangerous enemies are those which steal upon them at night, as the lynx, cerval, and other animals that seek their prey in darkness upon the trees. They are social in disposition, and live in large companies. The mothers are tender of their young, rearing them with care, loving and caressing them, and defending them unto death.



THE CHACMA.—(See p. 94.)

In a state of nature the magot lives on fruits, but when domesticated he eats all kinds of food. He puts nothing into his mouth, however, without having examined it carefully. He generally begins by first filling his huge cheek-pouches. He has great reputation as a maker of faces: it is thought he knows his talent, and cultivates it. When angry, his jaw chatters, his lips quiver, his motions become fierce and threatening, and his mouth utters hideous cries.

A few of this species are found among the rocks of Gibraltar, where the soldiers sometimes put tricks upon them by placing calabashes of wine in their way. The monkeys squeeze their heads in, but the calabashes adhere to their necks, and the wine swashes in their faces, blinding and stifling them, so that they are easily caught.

This animal was known to the ancients, and is that described and dissected by Galen. It is thought to have been once common in Europe, and the colony at Gibraltar is regarded as a vestige of the race probably once spread over the warm parts of that continent.

Genus CYNOPITHECUS: from the Greek *kuon*, a dog, and *pithekos*, a monkey.—Of this genus there is but one species, the BLACK MACAKE, *Cynopithecus niger*—the *Macacus niger* of some authors. This has no tail, is a little smaller than the magot, and is entirely black. Several specimens have been in the Garden of Plants at Paris and the Zoological Gardens of London, where they seemed familiar and playful. They are natives of Borneo and the adjacent islands.

Genus BABOON, *Cynocephalus*: from the Greek *kuon*, a dog, and *kephale*, the head.—We now come to some of the most remarkable of the monkey species—the *Baboons*. They have less of the human-like form and aspect than other members of the family, and more that of the mere brute. The most marked and prominent of the characters which more immediately distinguish the baboons from the other *Simiadæ* consist in the great prolongation of the face and jaws, and in the truncated form of the muzzle, which gives the whole head a close resemblance to that of a large dog, and from which the Greeks and Romans very appropriately denominated them *Cynocephali*, or *Dog-headed Monkeys*. In the ordinary Quadrumana, which have the head and face

round, as in the human species, the nose is flat, and the nostrils situated about half-way between the mouth and the eyes, the whole bearing no unapt resemblance to that of a man who has lost the greater part of his nose: but in the baboons this organ is prolonged uniformly with the jaws; it even surpasses the lips a little in length, and the nostrils open at the end of it exactly as in the dog.

The different species of this remarkable genus are widely disseminated over Central and Southern Africa. In their native haunts, their ordinary food is berries and bulbous roots, but in the vicinity of human habitations they make incursions into the cultivated fields and gardens, and destroy a still greater quantity of grain and fruits than they carry away with them. In well-inhabited countries, where they are likely to meet with resistance, their predatory incursions are usually made during the night: and travelers assure us that, taught by experience of the risks to which they expose themselves during such expeditions, they place sentinels upon the surrounding trees and heights to give timely warning of the approach of danger; but in wilder and more solitary districts, where the thinness of the population and the want of fire-arms place them on some degree of equality with the inhabitants, they make their forays in the open day, and dispute with the husbandman the fruits of his labor.

"I have myself," says Pearce, in his "Life and Adventures in Abyssinia," "seen an assembly of baboons drive the keepers from the fields of grain, in spite of their slings and stones, till several people went from the village to their assistance; and even then they only retired slowly, seeing that the men had no guns."

Some travelers assert that if the troop happens to be surprised in the act of pillaging, the sentinels pay with their lives for their neglect of the general safety. Others assure us that the troop sometimes form a long chain extending from the vicinity of their ordinary habitation to the garden or field which they happen to be engaged in plundering, and that the produce of their theft is pitched from hand to hand till it reaches its destination in the mountains. By this means, they are enabled to carry off a much larger booty than if every individual labored for his own particular benefit; but notwithstanding this attention to the general interest, each takes care before retiring to fill his cheek-pouches with the most choice fruits or grains which he can procure, and also, if not likely to be pursued, to carry off quantities in his hands. After these expeditions, the whole troop retire to the mountains to enjoy their booty. They likewise search with avidity for the nests of birds, and suck the eggs; but if there be young, they kill them and destroy the nest; as, notwithstanding the evident approximation of their organization and appetites to carnivorous animals, they are never known to touch a living prey in a state of nature, and even in captivity will eat no flesh but what has been thoroughly boiled or roasted. In this state, we have seen various baboons enjoy their mutton-bone and pick it with apparent satisfaction; but it was evidently an acquired habit, like that of drinking porter and smoking tobacco, which they had been taught by the example of their keepers.

Of all the Quadrumana, the baboons are the most frightfully ugly. Their small eyes deeply sunk beneath huge projecting eyebrows, their low contracted forehead, and the very diminutive size of their cranium, compared with the enormous development of the face and jaws, give them a fierce and malicious look, which is still further heightened by their robust and powerful make, and by the appearance of the enormous teeth, which they do not fail to display upon the slightest provocation. The fierceness and brutality of their character and manners correspond with the expression of their physiognomy. These characteristics are most strongly displayed by the males; but it is more especially when, in addition to their ordinary ferocity, they are agitated by the passion of love or jealousy, that their natural habitudes carry them to the most furious and brutal excess. In captivity, they are thrown into the greatest agitation at the appearance of young women. It is a common practice among itinerant showmen to excite the natural jealousy of their baboons by caressing or offering to kiss the young females who resort to their exhibitions, and the sight never fails to excite in these animals a degree of rage bordering upon phrensy.

The Chacma, or Choak-kama, *C. porcarius*, is of a uniform dark brown, almost black, mixed throughout with a dark-green shade, deepest on the head and along the ridge of the back, and paler on the anterior part of the shoulders and on the flanks. The hair over the whole body is

long and shaggy, more particularly on the neck and shoulders of the males, where it forms a distinct mane; each hair is of a light-gray color for some distance from the root, and afterward annulated throughout its entire length with distinct rings, alternately black and dark green—sometimes, though but rarely, intermixed with a few of a lighter and yellowish shade. The nose projects a little beyond the upper lip, the nostrils are separated by a small depression or rut, as in the dog and other carnivorous animals, and the callosities are less strongly marked than in most other species of this genus.

The Chacma, so called from the Hottentot word *T'Chac-kamma*, the aboriginal name of this baboon in South Africa, is one of the largest species of the present genus, and when full grown is equal in size, and much superior in strength, to a common English mastiff. It inhabits the mountains throughout the colony of the Cape of Good Hope, and associates in families more or less numerous. They are found on the Table Mountain above Cape Town, though they do not exist in such numbers as they appear to have done formerly. Still, they pay occasional visits to the gardens at the base of the mountains, and with such skill and caution, that even the most watchful dogs cannot always prevent them from committing extensive ravages.

M. Boitard furnishes us with the following account of one of these animals, confined in the Garden of Plants at Paris:

"All the *Cynocephales* are wicked and brutal, but nothing can equal the ferocity of the choak-kama, whose strength man is utterly unable to resist. I witnessed an instance of this some years ago at the menagerie. A man by the name of Richard, of a robust frame, and five feet eight inches in height, was at that time keeper of the monkeys, and his kitchen was exactly opposite the room where a choak-kama was confined. During his absence, one day, the monkey managed to open the door of his cage: he went into the kitchen, jumped upon a bench where there was a quantity of carrots for the nourishment of the animals, and began to tear up and devour the food of his companions in slavery.

"At this moment the keeper returned: he tried at first to get the animal back to his cage by coaxing him, but the saucy brute simply made faces at him, and continued his meal. Richard then raised his voice; but this only produced redoubled grimaces, accompanied with grindings of his teeth, and other menacing demonstrations. An unlucky idea then made the keeper take up a stick, which he had no sooner brandished in the air, than the monkey rushed upon him and thrust his two fists into his breast with such force that the powerful man reeled and nearly fell to the earth. The furious animal now returned to the charge, and before the astonished keeper could do any thing in self-defense, he threw him down with violence, pommeled him with his paws, and bit him so violently with his sharp teeth in his thigh, that fears were entertained for his life.

"As neither entreaty nor force prevailed to make the animal re-enter his cage, recourse was had to other means. Richard had a daughter who was a favorite with the choak-kama, for it was she who generally fed him. She suddenly conceived the idea of enticing him back to his cage by exciting his jealousy. She therefore placed herself at the other side of the cage, so that he could see her through the wires, and calling to her a young lad at work on the place, bade him attempt to kiss her. This excited the brutal jealousy of the monkey to such a pitch that he screamed furiously, and rushing into the cage in order to punish the lad for his indiscretion, the people around suddenly shut the door, and made him again a prisoner. You may suppose that any future attempts for liberty on his part proved futile."

The Tartarin, *C. Hamadryas*, the most celebrated of all the baboons, and probably the only species of this genus known to the ancients, inhabits the mountains of Arabia and Abyssinia, and measures upward of four feet when standing erect, and two and a half feet in a sitting posture. The face of this species is extremely elongated, naked, and of a dirty flesh-color, with a lighter ring surrounding the eyes; the nostrils, as in the dog, are separated by a slight furrow; the head, neck, shoulders, and all the fore-part of the body as far as the loins, are covered with long shaggy hair; that on the hips, thighs, and legs is short, and, contrasted with the former, has the appearance of having been clipped, so that the whole animal bears no unapt resemblance to a French poodle. While young, it is gentle, docile, and playful; but as soon as it has acquired its full



COMMON BABOON AND MONKEY.

development, it becomes sulky, malicious, and morose. It is not found either in Egypt or Nubia, though its figure is often sculptured on the ancient monuments of both these countries. We learn from Salt and Pearce that they are extremely common upon the high lands of the Abyssinian province of Tigré. They are usually seen in troops composed of ten or twelve adult males, and about twenty adult females; the remainder of the band is made up of the young of the four or five preceding years. When seen at a distance, approaching a small stream for the purpose of quenching their thirst, they bear a close resemblance to a flock of wild hogs. It has been observed that the young ones always lead the van, and the old males bring up the rear, probably for the purpose of having the whole family continually under their immediate observation.

The name of this species in the ancient Ethiopic or Geez, the learned language of the Abyssinians, is *Tot* or *Tota*. Its figure in a sitting posture is common upon the ancient monuments of Egypt and Nubia: small metal images of it have been dug up among the ruins of Memphis and Hermopolis, and mummies containing the embalmed body of the animal are still found among the catacombs. It is believed to be the emblem of the second Hermes, or Toth, the deified inventor of letters and the art of writing.

The Common Baboon, *C. papio*, is of a uniform yellowish-brown color, slightly shaded with sandy or light red upon the head, shoulders, body, and extremities; the whiskers alone are of a light fawn-color; the face, ears, and hands are naked and entirely black, the upper eyelids white, and also naked, and the tail about half the length of the body.

This species inhabits the coast of Guinea, and is that most commonly seen about the streets, and in menageries and museums. In youth it is gentle, curious, gluttonous, and incessantly in motion, smacking its lips quickly, and chattering when it wishes to beg contributions from its visitors, and screaming loudly when refused or tantalized. As it grows older, however, it ceases to be familiar, and assumes the morose look and repulsive manners which characterize the baboons in general.

The specimen observed by Buffon was full grown, and exhibited all the ferocity of disposition and intractability of nature common to the rest of its kind. "It was not," says he, "altogether hideous, and yet it excited horror. It appeared to be continually in a state of savage and restless ferocity, grinding its teeth, as if agitated by unprovoked fury. It was obliged to be kept shut up in an iron cage, of which it shook the bars so powerfully with its hands as to inspire the spectators with apprehension. It was a stout-built animal, whose nervous limbs and compressed form indicated great force and agility; and though the length and thickness of its shaggy coat made it appear to be much larger than it was in reality, it was nevertheless so strong and active that it might have readily worsted the attacks of several unarmed men."

It would appear that individuals of this species are sometimes of a cheerful temper. In the British Museum, there is a stuffed specimen of a baboon that formerly flourished in the Exeter Change Menagerie, under the title of "Happy Jerry." He was, in fact, one of the celebrities of

London, not only being a favorite with all visitors, but he once had the distinguished honor of being invited to visit his majesty George IV. at Windsor. He was nearly five feet high when standing on his hind-legs; he sat in a chair, drank porter from a pewter mug, and smoked his pipe, like a respectable John Bull.

Mr. Mathews gives the following account of a tame baboon in the possession of a Koranna in South Africa. Its master, knowing its intense dread of serpents, out of mere sport once put a dead snake around its neck. The creature sat for some time, quite stupefied by fear: when the object of its dread was removed, he slunk away into the hut. From this time he refused to obey his master, and when chastised with a stick, sprung upon him and bit him severely. Then, as if having thoroughly broken his bonds, he fled to the mountains. The Koranna, having recovered from his wound, and being determined on revenge, went in pursuit of the baboon. At last he descried him, peeping over a precipice. He took aim and fired, but the cunning creature had held another monkey forward which received the ball, while he himself scampered off to the woods.



THE BABOON MOTHER AND HER INFANT.

M. Boitard furnishes us with the following: "There have been, and still are, in the menagerie of the Garden of Plants, a number of baboons, and four years ago a female who had a young one furnished one of the most amusing and singular spectacles I ever witnessed. She was placed with it in a cage, near the one she formerly occupied with several other animals of the same species. The infant baboon was hideously ugly, but she lavished upon it the most tender caresses. When it was eight days old, the door of communication was opened, and her mate entered. The mother, seated in the middle of the cage, held the young heir in her arms, precisely as a nurse would do under similar circumstances. The happy father approached, and embraced his mate with French gallantry upon each side of the face; he then kissed the little one, and sat down opposite the mother, so that their knees touched each other. They then both began to move their lips with rapidity, taking the young one from each other's arms, as if they were having a most animated conversation concerning it.

"The door was again opened, and the baboon friends entered one after another, each embracing

the mother, who, however, would not allow them to touch the young one. They seated themselves in a circle, and moved their lips as if felicitating the happy couple on the arrival of the son and heir, and perhaps finding in it a marvelous resemblance to either the father or mother. This scene was very much like what often takes place in the human family on similar occasions, except that we suspect the felicitations were more genuine and heartfelt on the part of the brutes than on that of their more favored prototypes.

"All the baboons wished to caress the young one; but no sooner did one of them put forward his hand, than a good slap from the mother warned him of his indiscretion. Those who were placed behind her stretched their hand out slily, slid it under her arm, and succeeded sometimes, to their great joy, in touching the little one without the mother perceiving it, particularly when she was engaged in conversation. But a smart correction soon taught them that their indiscretion was observed, and they quickly retreated. It was evident that the monkey mother, thoroughly acquainted with the requirements of her position, knew perfectly well how to divide her attention between her guests and her infant charge.

"When the young baboon became old enough to exercise his infant limbs in climbing the iron trellis of the cage, the mother's eyes followed him with anxiety, watching him as he ascended and descended, and stretching her arms out to catch him in case of a misstep. At the same time she evidently encouraged him to effort, and applauded his success. From that time she did not cease to extend her care over him, until he was large enough to try his fortunes in the world alone."

The Mandrill, *C. Mormon* or *C. Maimon*, is the largest of the whole genus, and may be readily distinguished from all the other baboons by the enormous protuberance of its cheeks, and the bright and variegated colors which mark them, as well as by its short, stumpy tail. The full-grown mandrill measures above five feet when standing upright: the limbs are short and powerful, the body thick and extremely robust, and the head large and almost destitute of forehead; the tail not more than a couple of inches in length, and generally carried erect; the callosities large, naked, and of a blood-red color. The general complexion of the hair is a light olive-brown above, and silvery gray beneath. The muzzle and lips are large, swollen, and protuberant: the former is surrounded above with an elevated rim or border, and truncated like the snout of a hog—a characteristic more conspicuous in this than in other baboons, and which leads us to suspect that the mandrill is the species that Aristotle incidentally mentions by the name *Chæropithecus*, or *Pig-faced Baboon*. Altogether, the mandrill is a hideous combination of brutalities, rendered exceedingly striking by its strength, intelligence, ferocity, and gaudy coloring.

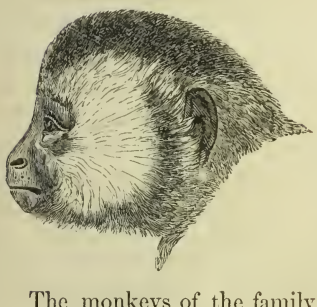
The mandrill is a native of Northern Africa: it is often mentioned by travelers, and bears the different names of *Smitten*, *Choras*, *Boggo*, *Barris*, &c., according to the language or dialect of the tribes in whose territories it is found. In a state of nature, his great strength and malicious character render him a truly formidable animal. As these creatures generally march in large bands, they prove more than a match for any other dwellers in the forests, and are even said to attack and drive the elephants away from the districts in which they have fixed their residence. The inhabitants of those countries are themselves afraid to pass through the woods unless in large companies and well armed; and it is said that the mandrills will even watch their opportunity, when the men are in the fields, to plunder the negro villages of every thing eatable, and sometimes attempt to carry off the women into the woods.

The Drill, *C. leucophæus*, is a native of the coast of Guinea, and like the mandrill is distinguished by a short, erect, stumpy tail, scarcely two inches in length, and covered with short bristly hair. The cheeks are not so protuberant as in that species, neither are they marked with the same variety of colors, and the size and power of the animal are much inferior. Nevertheless, it is frequently confounded with the mandrill in its native country.

The Wood Baboon, the Cinereous Baboon, and the Yellow Baboon, are all referable to this species, and differ only from the difference of the age and sex of the specimens from which descriptions of them have been drawn.

The other species of baboons are the *C. Gelada* of Abyssinia; the Papion, *C. sphinx*, of Western Africa—a very intelligent and interesting species, frequently seen in menageries; the *C. babouin*, whose natural history is little known; the *C. Anubis* of Nubia; and the *C. olivaceus* of Guinea.





3. MONKEYS OF THE NEW WORLD: PLATYRRHINÆ.

These, which embrace a great variety of species, are divided by naturalists into two tribes or families—*Cebidæ*, from the Greek, *kebus*, a monkey; and *Hapalidæ*, from the Greek, *hapalos*, tender—each embracing numerous genera. By most naturalists the *Platyrrhinæ* are not considered as true monkeys, and hence the term *Simia* is restricted by them to the apes and monkeys of the Old World; while *Simiadæ* includes those of both hemispheres.

The monkeys of the family *Cebidæ* have thirty-six teeth in all, the molars being six in number on each side of each jaw, instead of five as in the apes and monkeys of the other continent. The face is usually naked, but frequently surrounded by tufts or bushes of long hair, which give these creatures a singularly whiskered appearance. They have neither cheek-pouches nor posterior callosities, which are usually possessed by the Old-World monkeys. Their fingers are all furnished with flat nails, but the thumbs are sometimes deficient on the anterior members: their tails are always long, and generally prehensile. They are light and elegant in their forms, and exhibit wonderful agility in their movements, although they are inferior in strength to the monkeys of the eastern hemisphere. Their food is various; that of some species consisting almost entirely of insects, while others feed principally on fruits. The majority, however, appear to devour indiscriminately almost any thing that comes in their way—such as fruits, seeds, insects, eggs, and small birds. They are generally of diminutive size, and appear to be of a milder and more tractable disposition than their Old-World brethren.

In climbing about in the trees, the prehensile tails are of the greatest service to them; they serve, in fact, as a kind of third hand. This is especially the case with the Spider Monkeys, in which the tail appears to possess the greatest amount of prehensile power. They often suspend the whole weight of the body upon the tail alone, and its delicacy is so great that the animals can pick up small objects with it. The Spider Monkeys are destitute of thumbs on the anterior limbs. The Howling Monkeys are remarkable members of this family. In these the hyoid bone and thyroid cartilage are of immense size, and the former constitutes a bony case, which receives a large pouch communicating with the larynx. It is by the reverberations caused by this apparatus that the Howling Monkeys produce those tremendous sounds from which they have received their name, and which, when heard in the heart of the forest, are said to have a most appalling effect.

In the *Hapalidæ*, or Marmosets, there is the same number of teeth as in the Old-World apes; but the tubercles of the molars are acute, indicating the insectivorous habits of the animals. Notwithstanding this peculiarity in the dentition, however, they resemble the ordinary American monkeys in their general structure. They are all small, about the size of a large squirrel; their heads are rounded, and their ears, usually furnished with a tuft of hair, stand out on each side. The hind-feet are provided with an opposable thumb, which bears a flat nail; but all the other fingers of both pairs of extremities are armed with sharp claws, and the thumb of the anterior members

is scarcely opposable. The tail is long and usually bushy, but never adapted for prehension: the whole body is clothed with a soft woolly fur.

These elegant little creatures are found in great abundance in the forests of Brazil, where they run about the trees in a manner very similar to that of squirrels, which they resemble in appearance. They feed on insects and fruits, and also on birds and their eggs. Indeed, they seem to be very predaceous: notwithstanding which they may be easily tamed, and were formerly favorite pets with fashionable ladies. There are numerous species, twenty-five or thirty being already described; while, from the reports of travelers, there are doubtless many more which are still unknown to naturalists.

THE CEBIDÆ.

Buffon embraced the genus HOWLER, LAGOTHRIX, ATELES, and SAJOU, under the title *Helopithecus;* the genus CALLITHRIX, AOTES, and SAKI, under the term *Geopithecus;* and under the term *Arctopithecus*, the OUISTITIS; and TAMARINS. We shall notice the principal genera, without entering



THE GOLD-TAILED HOWLER.

into the subdivisions which naturalists have made in this extensive family of monkeys. It may be well to remark, however, that the species with prehensile tails have been denominated *Sapajous*, and those without, *Sagoins*. These terms, once in popular use, are now generally discarded, as they are not founded upon a natural division of species.

Genus HOWLER, *Mycetes:* from the Greek, *bellowing*.—Of this genus, which are the largest of the American monkeys, there are several species remarkable for the powerful development of the organs of the voice. The horrible yells sent forth by these animals from the depths of the forest, are described by those who have heard them as surpassingly distressing and unearthly. Humboldt and Bonpland heard them at the distance of half a league. It seems that their cries are chiefly uttered at night. Waterton, in his wanderings in the forests of Guiana, speaks of hearing these appalling sounds, at intervals, from eleven o'clock till daybreak. He says: "You would suppose that half the wild beasts of the forest were collecting for the work of carnage: now it is the tremendous roar of the jaguar, as he springs on his prey; now it changes to his



THE GOUARIBA, OR URSINE HOWLER.

deep-toned growlings, as he is pressed on all sides by superior force; and now you hear his last dying moan beneath a mortal wound."

The Stentor, or Ursine Howler, *Mycetes ursinus*, has been confounded with other species, and had a variety of names, as the *Ouarine Monkey*, the *Beelzebub Monkey*, the *Gouariba*, *Choro*, &c. These titles indicate a marked character, which it indeed possesses. It is found in Brazil and Colombia, and the adjacent provinces. It has thick fur, of a dark-brown color, much prized by the natives. Its body is eighteen inches in length; the tail long and prehensile. It lives in troops in the most solitary forests. While most monkeys avoid the water, and are incapable of swimming, this species dwells along the marshy borders of rivers, frequenting the small islands and spaces partially inundated, and sometimes even swimming streams of considerable width. In aspect this creature is sad, and in disposition savage and mischievous. It can neither be tamed nor subdued. It bites severely; and although it is not carnivorous, it inspires fear by its harsh voice and impudent air. When a troop of these animals are attacked by hunters, they assemble in a phalanx, and seek to frighten the intruder by their infernal din. They throw down upon the enemy the dried branches of trees, and even eject their excrements upon them. If all this fails, they usually retire, but in good order. If one is shot, and mortally wounded, he will often remain suspended by his tail. In some cases the monkeys gather around a wounded companion, examine the injury, draw out the lead, and stop the blood with their hands till one of the number brings some leaves, which are chewed and then thrust into the place.

The Gold-tailed Howler, *Mycetes chrysurus*—called *Araguato* by the natives—is found upon the borders of the Magdalena, in New Grenada, and is marked by a golden-yellow hue along the back, and spreading over one half the tail. The rest of the body is of a deep maroon-color. It lives in bands in the forest; and M. Roulin tells us that in their migrations they all follow a leader, each one imitating him exactly, even leaping or climbing as he has done, and putting his feet exactly in the same places. The name of Araguato is given by Humboldt, erroneously, to the preceding.

Besides these species, there is the Red Howler, *M. seniculus*, of Guiana, or Alouate of Buffon and Mono Colorado of Humboldt; the Russet-handed Howler, *M. rufimanus*, of Brazil;



THE MIRIKI, OR ERIODE ARACHNOIDES.

and the Black Howler, *M. niger*, found in Paraguay, Bolivia, and Brazil. Four other species are mentioned by Gray, *M. laniger*, *M. bicolor*, *M. auratus*, and *M. villosus*. Still one other is spoken of by Tschudi, as existing in Peru.

Genus LAGOTHRIX.—These monkeys are somewhat less robust and less noisy than the howlers; they are also of a milder character. Their tail is long and prehensile, and their fur very thick and soft. Castelnau's Lagothrix, *L. Castelnaui*, is found on the borders of the Amazon and in Peru. It is very sagacious, thievish, and gluttonous. When domesticated, it readily becomes obedient and affectionate to its keepers. Like the spider monkeys, it uses its long tail to seize things at a distance, which it afterward takes with its hands. It walks on its hind-legs easily when a person leads it by one of its arms. When teased, it utters a growling noise, and sticks out its lips like the orangs.

The other species are the Caparro or Negro Monkey, *L. Humboldtii*, found along the Orinoco, in Colombia and in Peru; the *L. infumatus*, and the *L. canus*, found in Brazil.

Genus ERIODES.—These have long prehensile tails, with a callosity under the extremity, as in the preceding genus and that of the ateles. The species are intermediary between the howlers and spider monkeys, in size, form, and character. The thumb of the fore-hand is wanting, or merely rudimentary. They make the woods ring during the day with their chattering cries. At the sight of the hunter they save themselves by flight, or hide in the tops of the trees. Three species, called *Mirikis*, are known—the *E. hemidactylus*, *E. tuberifer*, and *E. arachnoides*. Their particular habits, however, have not been well ascertained.

Genus SPIDER MONKEYS, or ATELES.—The Greek word *ateles* signifies *imperfect*, and is applied to this genus in allusion to the absence of the thumb on the hands, which characterizes them. The tail, however, by its extraordinary power, abundantly supplies this defect. So dextrous is it, as to be used on many occasions in preference to feet and hands, and hence is called a third hand. This animal usually carries it wound around the body, as if to preserve it, but it is uncoiled with amazing celerity when it is wanted. Buffon says: "In the use of their tail these animals are singularly dextrous. They can pick up with it even straws and bits of wood. M. Audebert tells us, that he saw one of the species carry hay in its tail to make its bed, and move and spread it about as easily as an elephant could have done with his trunk. In climbing, too, this member is of great use."

"There are," says Dampier, "in the Isthmus of America numbers of monkeys, some of which



THE ATELES, OR SPIDER MONKEY.

are white, but the most part black—some have beards, others none. These monkeys are very droll, and performed a thousand grotesque postures as we traversed the woods. When they are unable to leap from one tree to another, on account of the distance, or the tree being separated by a river, their dexterity is very surprising. The whole family form a kind of chain, locking tail in tail, or hand in hand; and one of them holding the branch above, the rest swing down, balancing to and fro like a pendulum, until the undermost is enabled to catch hold of the lower branches of some neighboring tree. When the monkey below has fixed his hold, the one above lets go, and thus comes undermost in turn; but, creeping up along the chain, attains the next branches of the tree like the rest; and thus they all take possession without ever coming to the ground."

This account has been doubted by some naturalists, but we are told by Mrs. Loudon that a similar feat is often performed by these monkeys in the menagerie of the Zoological Gardens at London. Modern travelers tell us that monkeys of this kind do actually cross rivers by forming a chain attached to the overhanging branches of the trees on one side. When the chain is long enough, they give it a swinging motion, which enables the lowest monkey to catch hold of the limbs on the other side. He mounts till the chain is drawn straight from tree to tree, when the opposite monkey lets go, and the whole group are transported across the stream without touching the water.

The ateles are generally very slender, the body not being more than a foot in length. They generally feed on insects, but they also catch small fishes and shell-fish, such as mussels and oysters: they crush the shells of the latter by pounding them between two stones. They are remarkably intelligent, gentle in their manners, and exceedingly light and graceful in their movements. The manner in which they put forth their long slender claws has given them the title of *Spider Monkeys*—a name which has sometimes been erroneously applied to the eriodes. They are fond of the society of man, and though sad of aspect, are confiding and affectionate. Their voice is a sort of flute-like whistle, often compared to the notes of birds. They are great favorites in the menageries.

Mr. Gardiner gives the following account of this species: "Those that live in the vicinity of the Brazilian plantations make sad havoc in the fields of Indian corn. Their want of a fore-finger or thumb seems to be made up by the handiness of another member, for in carrying off their plunder, they will take an ear of corn in the mouth, one in the arms, and a third in the prehensile tail!"

Mr. Gardiner had a tame animal of this kind called Jerry, which lived very much like one of the family, taking his regular meals, and always insisting upon his cup of tea before he went to bed. He ate raw eggs by making a hole in one end of them, then throwing back his head, and taking



SAJOU STEALING BIRDS' EGGS.—(See p. 105.)

them down at a gulp. He cracked nuts with his teeth, and cocoa-nuts by lifting them up and letting them fall. Being tied by a string, he would get objects that lay beyond his reach by the use of



THE WHITE-THROATED SAI, OR SAJOU.—(See p. 105).

a stick. He traveled with his master several thousand miles on the back of a large mastiff dog. Sometimes he would ride with his face toward the tail, by way of change. In going down a steep hill, he coiled his prehensile tail around that of the dog, as a crupper. The dog was fond of his



THE SAI, OR WEEPER.

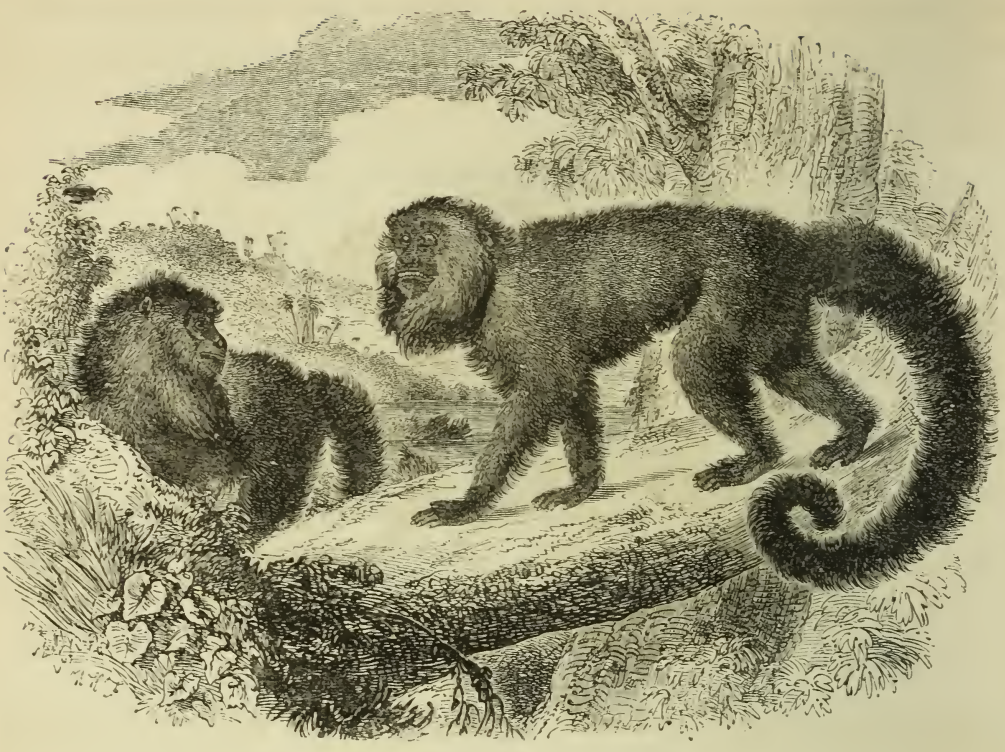
rider, and always before starting went to the place where the monkey was tied, and waited till he was put on and his cord tied to his collar.

Nearly a dozen species of ateles have been distinguished by naturalists, all bearing a close resemblance to each other. Most of them are found in the forests of Brazil and Guiana, and in the vicinity. The most remarkable of them are the Chameck, *A. pentadactylus;* the *A. paniscus*, or *Coaita* of Buffon; the *A. ater;* *A. marginatus;* the Marimonda, or *A. Brissonii;* the *A. melanochir;* and *A. hybridus.*

Genus SAJOU, *Cebus.*—These creatures are somewhat smaller, but less slender than the ateles: the tail is also less flexible. They are nimble in their movements and mild in their disposition. They have a familiar yet unobtrusive curiosity. There are numerous species in the wilds of Brazil, Guiana, and Peru, all living in troops, and feeding on fruits, grain, emmets, birds'-eggs, &c. Many of them fall a prey to the ocelot and other felidæ. They are known under the various names of *Sajous*, *Sapajous*, *Weeping Monkeys*, *Musk Monkeys*, &c. They are much used in Europe as well as in America by itinerant musicians, for climbing up to the windows to receive contributions. In France I have often seen them perform as mimic soldiers, ride upon dogs with the air of jockeys, and execute a thousand other tricks of the kind. This they did with a ludicrous calmness of manner, as if they actually regarded their drolleries as the most serious business in the world.

A specimen of this monkey in the Garden of Plants, by the name of Jack, attracted much attention by his intelligence. If nuts were given him, the shells of which he could not break with his teeth, he cracked them with a stone. One day as he sat aloft in his cage, some nuts were presented to him, all of which he cracked with his teeth save one: this was so large he could not put it into his mouth; so he began to descend in order to get a stone. On his way he met with a large nail sticking out of a post: he instantly struck the nut smartly against the nail and broke it. All this was done as if it was a matter of course.

The most remarkable species of sajou besides the above are the following: The Brown Sajou, *C. apella*, *C. robustus*, and *C. variegatus*, all of Brazil. The Tufted Capuchin, *C. cirrifer*, of Guiana, *C. vellerosus*, *C. frontatus*, *C. elegans*, *C. barbatus*, *C. flavus;* the Sai, or Weeper, *C. capucinus*; *C. castaneus*, *C. versicolor*, *C. chrysopus*, *C. hypoleucus*, are found in various



THE COLLARED TEE-TEE, OR CALLITHRIX.

parts of tropical South America. They are generally about twelve or fourteen inches in length, and bear a great resemblance to each other.

Genus CALLITHRIX, *Callithrix.*—The monkeys of this genus are called *Sajous* by some authors. Several of the species are also called *Ti-ti*, or *Tee-tee*. They are found in Brazil and the vicinity. They have thick fur, and a long tail entirely covered with hair, but not highly prehensile. In size, and also in general character, they resemble the sajous.

The Ouappo, or Ouapoussa, *C. discolor*, is found on the borders of the Amazon and in Peru. Its color is of a reddish gray, spotted with maroon. In running about among the branches of the trees, they display admirable grace and agility. The females carry their young ones on their backs, and even thus encumbered seem to have the lightness of birds. During the day they remain rolled up in balls, uttering from time to time a kind of internal cry, whence they are called *Ventriloquial Monkeys* and *Singing Monkeys.* When evening comes they resume their activity, and go forth to obtain their food, which consists of fruits and insects. They are gentle, but not very intelligent. They readily submit to domestication, in which state they eat cooked meats, sweetmeats, and other food.

The other species of callithrix are the *C. amictus;* the Collared Callithrix, *C. torquatus;* the Masked Callithrix, *C. personatus; C. gigo;* the Black-handed Callithrix, *C. melanochir;* the Mitred Callithrix, *C. infulatus; C. donacophilus*, *C. moloch*, and *C. cupreus.*

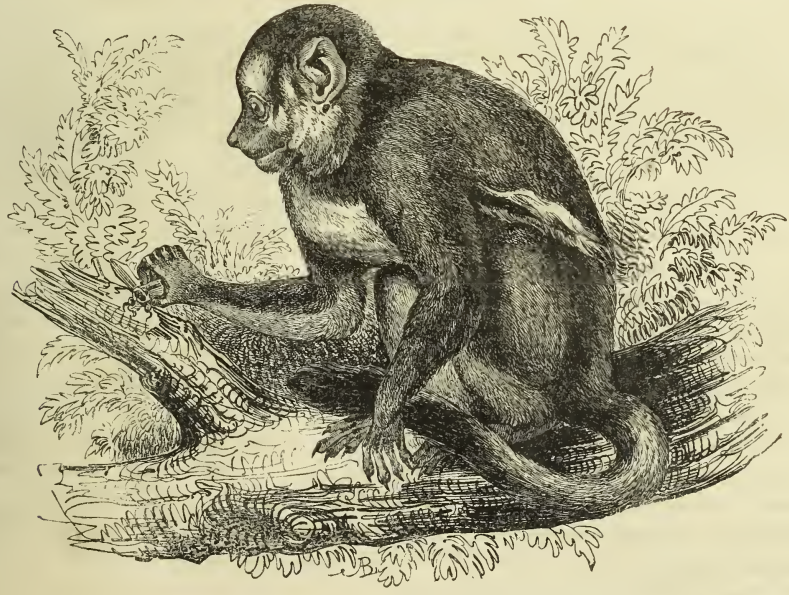
Genus SAIMIRI, *Saimiris.*—The animals of this genus are but about ten inches in length, and are the most slender, graceful, and interesting of the whole monkey family. The large development of the brain is one of their most striking characteristics. The tail is but slightly prehensile, yet is used in climbing trees. Humboldt tells us they are very sympathetic, and that when they have any cause of sadness their eyes fill with tears. When a person is talking to them, they seem greatly interested, and try to seize the words as they issue from the mouth. They recognize the objects represented by engravings, as fruits and insects, and approach and attempt to seize

them. They live on insects, and especially spiders, which they catch with admirable dexterity alike with their hands and their lips.

The species of this genus are the Tee-tee, or Squirrel Monkey, *S. sciureus*, of Guiana and Brazil; the *S. ustus*, of Brazil; and the *S. entomophagus*, found in troops in Bolivia and Peru. M. Geoffroy mentions another species under the name of the Orinoco Ti-ti, *S. lunulatus*.



Genus NYCTIPITHECUS: *Nyctipithecus*.—These are about ten to twelve inches long, and are distinguished by a large round head, and eyes that give out phosphorescent light in the darkness. They sleep by day and are active at night, and hence are called *Nocthores*, or Night Monkeys, by French authors. They live in hollow trees, and do not gather in bands. They are found in Brazil.



THE DOUROUCOULI.

The best known of this genus is the Douroucouli Monkey, *N. trivirgatus*. Its general color is gray: its body and head measure ten inches. It lives on the borders of the Orinoco, and is nocturnal in its habits. It is sad of aspect, and solitary in its disposition. It passes the day in sleep, and



THE WHITE-HEADED SAKI.—(See p. 110.)

at night goes forth in quest of food, which consists of sweet fruits and eggs, though small birds do not come amiss. One of them in the Garden of Plants lived on milk, biscuit, and fruits.



THE RED SAKI, OR BRACHYURE.

THE BALD SAKI, OR BRACHYURE.—(See p. 110.)



THE MONK SAKI: P. MONACHUS.—(See p. 110.)

The Bellowing Monkey, *N. vociferans*, is found on the borders of the Paraguay and in Brazil. Like the douroucouli, with which it is often confounded, it has a cry at night resembling that of the jaguar, and hence has been called the *Mona-tiger* and *Titi-tiger*. Travelers are frequently put in a state of trepidation by the cries of these innocent little creatures.



SATANIC SAKI.—(See p. 110.)

The *N. Oseryi* inhabits the borders of the Upper Amazon and Peru: the *N. lemurinus* is found in the mountainous parts of New Grenada. They live in small families, sleeping in nests of leaves by day, and going forth only at night for food. They utter a frequent cry of *douroucou*, which has doubtless given rise to the name of one of the species, the douroucouli. The Vitoe, or *N. felinus*, is found in Bolivia and Brazil.

Genus SAKI, *Pithecia*.—The monkeys of this genus are marked by a short head, an angular muzzle, and a non-prehensile tail. They are gentle, intelligent, slender of form, and partially noc-

turnal in their habits. They generally live by couples or in small families. The males share with the females the care of rearing the young; but when these have arrived at years of discretion, the fathers drive them away. The genus is divided into two branches—the *Brachyures*, which have very short tails, and the *Sakis proper*, with long, large tails.

The Red Saki, *Brachyurus rubicundus*, is about fifteen inches long, the tail having the appearance of a large hairy ball. The fur is reddish, the face vermilion, and the top of the head nearly bald. It is found in the valleys of the Upper Amazon.

The Bald Saki, *Brachyurus calvus*, resembles the preceding, and is found in Brazil and Peru. The *B. ouakary* and the *B. cacajo*, or *Pithecia melanocephala* of E. Geoffroy, are found on the borders of the Orinoco.

The White-headed Saki, *Pithecia leucocephala*, is one of the long-tailed species. Its body measures fifteen inches, and its tail seventeen. It is found in Guiana, where it is called *Yarkee*. Some other species are called *Yarkee* by the natives.

The Gold-headed Saki, *Pithecia ochrocephala*, the *P. chrysocephala*, *P. monachus*, *P. mariquoina*, *P. inusta*, *P. albinasa* *P. satanas*, *P. hirsuta*, *P. cheiropotes*, are the other species.



THE OUISTITI, OR MARMOSET.

THE HAPALIDÆ.

This family, as already stated, embraces the Ouistitis and the Tamarins.

Genus OUISTITI.—*Hapale*:—These animals are called *Squirrel Monkeys*, because in size, sprightliness, and manner of running along upon the trees, they resemble squirrels. They are six or eight inches in length; their fur is thick, and of various colors; the tail long, covered with hair, and non-prehensile; their nails are long and sharp, enabling them to run along upon the smallest and most flexible branches of the trees. They inhabit wooded districts, and live in small bands. Both male and female assist in rearing the young, though the mother occasionally eats off the head of one of her offspring. She usually carries the young on her back, but when she gets tired, does not hesitate to rub them off against a tree. These are less intelligent than other monkeys, and have neither the cunning, nor the strength, nor the love of liberty which marks the other species. Nevertheless, they are so small, soft, gentle, and graceful, as to be pets with many persons. Ladies of quality, a century ago, held them in great estimation. They are found in different parts of tropical South America.

The Ti-ti, or Jacchus, *Hapale jacchus*, or *Simia jacchus*, described by Buffon, is generally of an ash color, and has long gray hairs standing out from the side of its head. The face is of a flesh

color; the tail is ringed with black and gray. It is not more than seven inches in length, and is a general favorite, though in captivity it is lazy and indifferent in its demeanor. In its native woods it is more active, killing insects and small birds with admirable dexterity. It often descends from the trees and makes a meal of snails and lizards. The male and female seldom separate, though they manifest little affection for one another.

There are many other species, as the White-necked Ouistiti, *H. albicollis*, *H. aurita*, *H. humeralifer;* the White-headed Ouistiti, *H. leucocephala;* the Mico, *H. melanurus* and *H. pygmea* —the smallest of the genus, not being over six inches long.



THE PINCHE.

Genus TAMARIN: *Midas.*—These resemble the above, and many of them are called Ouistitis. The species are numerous.

The Marikina, Silky Monkey or Lion Monkey, *H. rosalia*, is a beautiful little creature, covered with golden yellow fur. It was formerly a great favorite with ladies of rank in France, and one of them, belonging to Madame Pompadour, was described by Buffon. The Pinche, *H. Œdipus*, is of a yellowish-brown color, and is found in Guiana, Brazil, and Peru. In domesticity it sleeps during the day, and at night becomes exceedingly active. The other species are the *H. chrysomelas; H. leonina; H. Geoffroyii*, found on the Isthmus of Panama; the Negro Tamarin of Buffon, *Tamarin niger; H. bicolor;* the Midas Monkey, *H. Midas; H. rufoniger*, *H. Devillei*, *H. flavifrons*, *H. Weddellii*, *H. Illigeri*, *H. nigrifrons*, *H. labiata*, *H. pileata*, and *H. mystax.*



GENERAL REMARKS ON THE MONKEY FAMILY.

We have thus devoted a large space to the Monkey Family, for although in some respects repulsive, they are still ceaseless objects of interest, as well on account of their own peculiarities as the curious manners and customs of different nations connected with them. They are also inhabitants of the tropical regions of the earth, and hence are associated with the most gorgeous and wonderful displays of animal and vegetable life. Thoughtless, playful, given up to an existence in which even the cares of life seem a perpetual round of gambols; in the midst of undying verdure and bloom; gay as the birds, careless as the winds, often variegated in color as the flowers, they seem—if we leave out the graver species, the apes and baboons—to be the very personification of mirth, frolic, and fun. Subsisting, at least in part, upon insects and the eggs of birds, or the birds themselves, they in turn furnish a perpetual feast to the prowling leopards, panthers, jaguars, and ocelots, and the still more subtle and treacherous boas and anacondas, that lurk in the tropical forests, thus supplying a link in the great chain of renovation and destruction, which sums up the history of animal life. If mankind are disposed to criticise either their looks or their manners, by applying standards of personal beauty or rules of moral conduct not made for monkeys, we should still not overlook the fact, that in their native haunts they seem as perfectly to fulfill their destiny as any other of the works of nature.

Those who are in the habit of satirizing the monkey creation, should reflect upon the infinite pleasure which children in all countries derive from the pranks and gambols of these creatures. Mary Howitt, with the cheerful eyes which happily find beauty and pleasure everywhere, seems to see this subject in its true light, when she says—

"Monkey, little merry fellow,
Thou art Nature's Punchinello:
Full of fun as Puck could be,
Harlequin might learn of thee.

"Look now at his odd grimaces—
Saw you e'er such comic faces?
Now like learnèd judge sedate,
Now with nonsense in his pate.

Nature, in a sunny wood,
Must have been in merry mood,
And with laughter fit to burst,
Monkey—when she made thee first.

"How you leaped and frisked about
When your life you first found out!
How you threw, in roguish mirth,
Cocoa-nuts on mother earth!

"How you sat and made a din,
Louder than had ever been—
Till the parrots, all a-riot,
Chattered, too, to keep you quiet!

"How the world's first children ran
Laughing from the monkey-man!—
Little Abel and his brother,
Laughing, shouting to their mother.

"And could you keep down your mirth
When the floods were on the earth?
When, from all your drowning kin,
Good old Noah took you in?

"In the very ark, no doubt,
You went frolicking about;
Never keeping in your mind
Drowned monkeys left behind."

After all, what could we do without the monkeys? How much of our pleasant literature would perish if they were to be struck out of existence! Certainly they are the heroes of many of the best fables of Lafontaine, and other moralists of his school. Who has not been instructed and amused by Trumbull's epigrammatic story of the monkey who, having lathered himself in imitation of his master—

"Drew razor swift as he could pull it,
And cut from ear to ear his gullet!"

The following is an example of a graver satire, for which we are indebted to the monkeys:

"A traveler in Africa was one day astonished to observe a vast procession of monkeys marching over a plain, with countenances indicative of the deepest sorrow. There was the little frisky green monkey—but his countenance was grave and woe-begone; there was the red monkey, and the baboon, and the chimpanzee, and all seemed full of grief, as if some great calamity had befallen them. Instead of the leaps, and frolics, and grimaces usually seen among this four-handed family, they marched forward with long and regular steps, to a grave and solemn tune, sung by a choir of appointed howlers.

"After marching a considerable distance, the vast procession, consisting of many thousands, approached a low mound of earth. Here the head of the train halted, and the rest came up and arranged themselves around the mound. Then the whole troop set up a most piteous wail; then some of them began to dig into the mound of earth, and pretty soon they disclosed the half-decayed skeleton of a monkey. This was raised upon an altar, and then all the monkeys bowed down to the bones, and paid them reverence. Then one of the most noted of the monkeys, a famous lawyer among them, stood up and made an eloquent address. The monkeys, apes, and baboons sobbed, and sighed, and howled, as the orator proceeded. At length he finished with a pathetic and sublime flourish, and the congregation shed tears, and wiped their eyes, and then they laid the bones in the ground again, and then they heaped up the earth over it to a vast height; and they reared a monument upon it, with an inscription setting forth the virtues and services of the dead monkey, and then they all went away.

"After the multitude had dispersed, the traveler went to the orator, and asked him what all this meant: whereupon he said, that it was the custom with the monkeys, when any one rose up among them of supreme sagacity, or superior excellence, to envy and hate him—to persecute him and to put him to death; but after many years they always dug up the decayed bones and worshiped them, to testify their gratitude and repair their injustice, by honoring the memory of the monkey they had reviled while living.

"This sounded so ridiculous to the traveler that he laughed outright; but he was soon rebuked by the monkey, who spoke gravely as follows: 'Your mirth, sir traveler, is ill timed, and shows a want of due reflection. We monkeys are great imitators, and in this matter we do but follow the fashion of our betters. Some monkeys have traveled as well as you, sir, and they tell us mankind usually revile those who are remarkable for goodness or greatness while they are living, and often bring them to a premature grave, either by persecution or neglect; but afterward, when their bones are decayed, they make up for their folly and injustice by paying great honor to their memory, digging up their remains, singing hymns, delivering orations, and erecting monuments over their ashes!'"



The following "ESTIMATE OF THE MORAL CHARACTER OF MONKEYS," by a clergyman, Rev. W. Jones, designed as a satire on men-monkeys rather than on the true *simiæ*, is not only very lively and witty, but an excellent moral application of the subject we are discussing:

"A gentleman whose premises were infested by a large breed of sparrows, said they were *birds of no principle*. Of all monkeys it may be said, with much more propriety, that they are beasts of no principle, for they have every evil quality, and not one good one. They are saucy and insolent, always making an attempt to bully and terrify people, and biting those first who are most afraid of them. An impertinent curiosity runs through all their actions; they never can let things alone, but must know what is going forward. If a pot or a kettle is set on the fire, and the cook turns her back, the monkey whips off the cover to see what she has put into it, even though he cannot get at it without setting his feet upon the hot bars of the grate.

"Mimicry is another of the monkey's qualities. Whatever he sees men do, he must affect to do the like himself. He seems to have no rule of his own, and so is ruled by the actions of men or beasts—as weak people follow the fashion of the world, whether it be good or bad. No monkey has any sense of gratitude, but takes his victuals with a snatch, and then grins in the face of the person that gives it him, lest he should take it away again; for he supposes that all men will snatch away what they can lay hold of, as all monkeys do. Through an invincible selfishness, no monkey considers any individual but himself, as the poor cat found to her cost, when the monkey burned her paws with raking his chestnuts out of the fire. They can never eat together without quarreling or plundering one another.

"Every monkey delights in mischief, and cannot help doing it when it is in his power. If any thing he takes hold of can be broken or spoiled, he is sure to find the way of doing it; and he chatters with pleasure when he hears the noise of a china vessel smashed to pieces upon the pavement. If he takes up a bottle of ink, he empties it upon the floor. He unfolds all your papers, and scatters them about the room, and what he cannot undo he tears to pieces; and it is wonderful to see how much of this work he will do in a few minutes, when he happens to get loose. Everybody has heard of the monkey whose curiosity led him to the mouth of a cannon to see how it went off, when he paid for his curiosity with the loss of his head.

"In a ship where a relation of mine was an officer, while the men were busy in fetching powder from below, and making cartridges, a monkey on board took up a lighted candle, and ran down to the powder-room to see what they were about; but happily was overtaken just as he got to the lantern, and thrown out at the nearest port-hole into the sea with the lighted candle in his hand. Another lost his life by the spirit of mimicry: he had seen his master shaving his own



THE BELLOWING MONKEY.—(See p. 109.)

face, and at the first opportunity took up the razor to shave himself, and made shift to cut his own throat. When the wild monkeys have escaped to the top of trees, the people below who want to catch them show them the use of gloves, by putting them on and pulling them off repeatedly; and when the monkeys are supposed to have taken the hint, they leave plenty of gloves on the ground, having first lined them with pitch. The monkeys come down, put on the gloves, but cannot pull them off again; and when they are surprised, betaking themselves to the trees as usual, they slide backward and are caught. A monkey who had seen his mistress upon her pillow in a nightcap, which at her rising she pulled off and hung upon a chair, put on the cap, laid his head upon the pillow, and, by personating the lady, made himself ten times more frightful and ridiculous,—as awkward people do, when they *ape* their superiors, and affect a fashion which is above their sphere.

"A mischievous disposition is always inclined to persecution. There are minds whose greatest pleasure it is to ride and tease the minds of other people. A late friend and neighbor of mine in the country kept a monkey who took to riding his hogs, especially one of them, which he commonly singled out as fittest for his use; and leaping upon its back, with his face toward the tail, he whipped it unmercifully, and drove it about till it could run no longer. The hogs lived under such continual terrors of mind, that when the monkey first came abroad in the morning, they used to set up a great cry at the sight of him.

"A well-known nobleman once had a wild horse whom nobody could ride. 'I know not what your lordship can do with him,' said one, 'but to set the monkey upon his back.' So they put a pad to the horse, and set the monkey upon it with a switch in his hand, which he used upon the horse, and set him into a furious kicking and galloping; but Pug kept his seat and exercised his switch. The horse lay down upon the ground; but when he threw himself on one side, the monkey was up on the other: he ran into a wood with him, to brush him off; but if a tree or bush occurred on one side, the monkey slipped to the other side; till at last the horse was so sickened, fatigued, and broken-spirited, that he ran home to the stable for protection. When the monkey was removed, a boy mounted him, who managed the horse with ease, and he never gave any trouble afterward.

"In all the actions of the monkey, there is no appearance of any thing good or useful, nor any species of evil that is wanting in them. They are, indeed, like to mankind: they can ride a pig

as a man rides a horse, or better, and are most excellent jockeys; but, after all, they are only like the worst of the human species. If all the qualities of the monkeys are put together, they constitute what is called *ill-nature;* and if any person would know what an ill-natured man is, that man is a monkey to all intents and purposes, with the addition of reason, which makes *his* character much worse, with the loss of religion and conscience, which is worst of all; for without these, reason is rather a disadvantage."

In the light in which we regard this sermon on monkeys by the preacher, it is, as we have said, alike significant and instructive. If it were to be taken as a serious homily against the four-handed family who are the subject of it, it would be both unjust and injurious. We must receive Nature's works as she made them, and judge them accordingly. The baboon with his snout painted sky-blue, and declaring it to be "neat, not gaudy," had just as good a right to insist upon his pre-Raphaelitcism as Mr. Ruskin has upon his—the whole thing being a mere matter of taste.

Let us always start fair in our estimates of the brute creation, taking good Dr. Watts for a guide:

"Let dogs delight to bark and bite,
For God hath made them so;
Let bears and lions growl and fight,
For 'tis their nature too."

If, indeed, we persist in denouncing the monkeys as a thievish, fickle, and disgusting race, and thus bring them to trial under a code which they cannot comprehend, let us see how the tables may be—nay, perhaps are—turned upon us.

We are told that some of the tribes of South American howlers which we have described in the preceding pages hold mass meetings, in which one of the monkeys takes an elevated position, from which, as from a desk or a rostrum, he harangues the assembly. Travelers who have witnessed these scenes, all speak of the ludicrous resemblance in such cases to certain human exhibitions, as well on the part of the orator as the listeners. It would not require a great stretch of imagination to suppose that human beings are sometimes the theme of their discourses; nor would it be difficult to imagine the figure they would make in these "Moral Estimates of Men in a Monkey point of view." To these creatures mankind must be chiefly known as shooting them down—wounding, mangling, destroying them—often in mere wantonness of sport, often for the cannibal desire of devouring them, often for the purpose of carrying them into captivity, and often in vindication of that hereditary contempt and spite which every race of man indulges against all other races that resemble it and yet are not of it. To the monkeys, man must be a butcher, a cannibal, a thief, a robber, a disturber of the peace, a tyrant, an enslaver,—in short, the incarnate devil; and we may therefore easily fancy that, in the howling eloquence of monkey stump-orators, he is often used as a climax to "point a moral or adorn a tale." The intense agitation, the uncontrolable terror, the bitter hate, displayed by howlings and hissings, groanings and gruntings, on the part of a community of monkeys, when a man happens to invade their forest sanctuaries, sufficiently attest the instinctive horror they entertain of a family that, of all the world, have the greatest resemblance to themselves.

One thing more, as faithful historians, we are bound to state, showing that the ancestry of the monkeys takes precedence of that of Man. Mrs. Howitt, in the lines we have quoted, seems to imagine that the monkeys were created about the time of Adam and Eve; but this is a mistake. Long, long ages before man became an inhabitant of the earth, apes and monkeys—diversified in form, and multitudinous in number—had frisked and frolicked upon its surface. The fossil remains of these creatures are found abundantly in different quarters of the globe—not in present tropical countries only, but even in England and France, and in situations which carry back their existence to the dim and distant eras of the world when these countries were covered with a tropical vegetation, and monsters now extinct sported in their forests and in their waters.



GALAGOS —(See p. 118.)

THE LEMURS, CHEIROMYS, &c.

Under this head we shall notice several very curious animals, as the LORIS, GALAGO, TARSIER, INDRI, MAKI, and CHEIROGALE, all of which may be considered as *Lemurs*, with the CHEIROMYS or AYE-AYE, and the GALEOPITHEC or FLYING LEMUR. These are dissimilar in certain respects, yet they all possess characteristics which entitle them to a place next the monkeys—viz., they are all four-handed, and have thumbs on their hinder feet, opposable to the fingers. The greater part of them are confined to Madagascar; some live in Africa, and some in India and the adjacent islands. None are found either in Europe or America.

Genus LORIS: *Loris.*—Of this genus there are two species—one called the SLENDER LORIS, *Loris gracilis*, and the other the LAZY LORIS, *Loris tardigradus.* These are small animals, about the size of the ouistiti, and covered with hair. The legs are rather short, the head rounded, the ears small and covered with hair, and the face long and pointed. They have no external trace of a tail. Their movements are peculiarly awkward, slow, and cautious, resembling those of the chameleon: they live on trees, and are nocturnal in their habits, feeding on fruits, mice, insects, small birds, and eggs. Specimens have been taken to Europe, where they appeared to be gentle, inoffensive, and rather intelligent. They are often described under the name of *Slow Lemurs*, or *Slow-paced Lemurs.*

The *Slender Loris* is about a foot in length, of a russet color, with a white band on the face and nose. It is found in the island of Ceylon and the adjacent parts of the continent. The *Lazy Loris* is somewhat larger and more robust than the preceding. It is covered with long, coarse, woolly hair, of a reddish tinge on the upper parts of the body, with a line of brown running along the back. Each of the eyes is surrounded by a ring of dirty black. It is a native of Sumatra, Java, and Borneo, and perhaps of Bengal. It is sometimes called the *Poucan.*

Genus PERODICTICUS.—Of this, ranged by some authors with the galagos, there is but a single species, the POTTO, *Perodicticus potto.* It has greatly puzzled the naturalists, as it seems to partake of several nearly allied species. It is a native of Africa, in the country around Sierra Leone, where it is called the BUSH-DOG. It is smaller than a cat, being only ten inches long. It

lives on the trees, and is slow in its movements. It has an opposable thumb on each of the hands; the fore-hands, however, want the forefinger, and the other fingers are set in such a manner that the hands appear like pairs of pincers. The body is thick-set, and of a reddish-gray color; the tail is short. Though specimens have been seen in London and Paris, its habits in a state of nature are little known. It is said, however, to feed on vegetables, and chiefly the *cassada*.

Genus GALAGO: *Galago.*—There are several species of this exceedingly pretty animal,—some natives of the woods of Senegal, where one kind receives the name of *Khoyah;* others are found in Southern Africa. They have the organization of the primates, with the graceful appearance of the squirrels. The head is large and round; the membranaceous ears remarkably large, and closed when the animal is sleeping; the eyes are large, and of a soft expression; the fur soft, the tail long; the teeth twenty-six, as with the maki, loris, and sapajou. They are mostly nocturnal, sleeping in grassy nests in the trunks of trees during the day: are of an inoffensive disposition, and live among the trees, feeding on insects, small birds, fruit, and gum. They are very active, and in their grimaces and gesticulations resemble the monkeys.

The species are the Senegal Galago, *G. Senegalensis;* the Black Galago, *G. Alleni; G. crassicaudatus*, the largest species; and *G. Demidoffii*, or Little Galago, the smallest of the family.

Genus TARSIER: *Tarsius.*—The Specter Tarsier, *T. spectrum*, called *Podje* by the natives, is the only species of this genus, and is found in Borneo, the Celebes, and Banca. From the latter it is sometimes called *T. Bancanus.* The naturalists have been greatly embarrassed as to the family it belongs to: some have called it a jerboa, some a lemur, and some a relation of the marsupial animals of New Holland. It is at last wisely determined to make it a genus by itself. It is an exceedingly graceful little creature, about the size of a common rat, yet resembling the monkeys in form. It is gentle and tranquil, and feeds on insects. Its fur is soft, and the



THE SLENDER LORIS.



TARSIER

general color a grayish brown; the hands are very delicate, naked within and furred without.

Genus INDRI: *Indris.*—This genus includes only a single species, the SHORT-TAILED INDRI of Madagascar, *I. brevicaudatus.* It is the largest of the lemuridæ, being three feet high when it stands on its hind-legs. It is covered with soft, thick fur, mostly black, but whitish on the face, and reddish white on the sides. Though its general look is like that of a small bear, it is a gentle creature, and capable of some education. The natives think it has the form of a man, and call it the *Man of the Woods.* It is certainly the most anthropomorphous of all the lemuridæ.

Genus PROPITHECUS.—Of this there is but a single known species, the *P. diadema*, of Madagascar, resembling the indri, but somewhat smaller. Specimens have been seen in the menageries of the Garden of Plants and of the Zoological Gardens.

Genus AVAHI: *Avahis.*—One species only is known, the WOOLY AVAHI, *A. lanig·r*, of Madagascar, and called *Ampongue* by the natives. It is about a foot long, and has a tail half the length of its body. Some naturalists call it the *Long-tailed Indri.* Little is known of its habits.

Genus MAKI: *Lemur.*—The makis are the proper lemurs, and are distinguished by thick, soft fur, a slender body about two feet long, a very long bushy tail, and a pointed nose. The expression of the face has given them the title of *Fox-nosed Monkeys.* They are intelligent, and capable of some education. They have frequently been in the menageries of London and Paris, where they bear the climate tolerably well, taking great comfort, however, in sitting by the fire in the winter. One of them lived in the latter city nineteen years. Several species have bred in the European menageries. At Malmaison, one of these creatures, kept by the Empress Josephine, produced a young one which she treated with great tenderness: during its infancy it was almost naked, and



THE INDRI



WHITE-FRONTED LEMURS.

she carried it on her back, imbedded in the deep fur, nearly the whole day. In their general mode of living the lemurs greatly resemble the monkeys, their food consisting of fruits. Some fourteen species are known, all confined to Madagascar.



THE RED LEMUR.

The Ring-tailed Macauco, *Lemur catta*, is of an ashy-gray color, the tail being annulated with black bands. The Ruffed Lemur, *L. macaco*, is marked by irregular black and white spots. It is sometimes called the *Magpie Maki*. The Red Lemur, *L. ruber*, is noted for its brilliant colorings, the greater part of the body being covered with a vivid russet: the hands, face, and tail are black; on the back of the neck there is a large patch of white.



CHEIROGALE.

The Red-bellied Lemur, *L. rubriventer;* the Yellow-bellied Lemur, *L. flaviventer;* the Strawberry Lemur, *L. collaris;* the Russet Lemur, *L. rufus;* the White-handed Lemur, *L. albimanus;* the White-fronted Lemur, *L. albifrons;* the Black-faced Macauco, *L. nigrifrons;*

and the MONGOUS, *L. mongoz*, are well-known species. The latter is one of those most frequently brought to Europe. The other species are the *L. Anjuanensis*, *L. coronatus*, and *L. chrysampix*.

Besides these there are the LITTLE GRAY MAKI of Buffon, *L. griseus*, and the *Lepilemur mustelinus*, both resembling the true lemurs, but probably constituting a distinct genus.

Genus CHEIROGALE.—These animals have round heads, like the cats, the snout short, the lips garnished with mustaches, the ears small and oval, the eyes large, staring, and close together. The tail is long and thickly furred, and is frequently carried coiled round the body of the animal.

The DWARF MAKI of Cuvier, *Cheirogaleus Milii*, is the smallest of the genus, the body being only a foot long, and the tail of equal length. The color is a yellowish gray. A specimen in the Garden of Plants kept himself in a nest of hay—which he made for himself, from materials furnished by the keepers—during the day, and at night he went forth and displayed great activity until the morning. His big eyes were much distressed by the light of a lamp or candle. His food consisted of fruits, bread, and biscuit.

The other species are the *C. furcifer*, and the LITTLE MACAUCO, *C. murinus*.



CHEIROMYS.

Genus CHEIROMYS.—Of this genus a single species only is known, the AYE-AYE, *C. Madagascariensis*, which has excited much curiosity by its singular formation and habits. A specimen was obtained by the French naturalist Sonnerat at Madagascar, and from his account our knowledge on the subject is mostly obtained. He says the animal is found chiefly, if not exclusively, on the western part of the island, and resembles alike the maki, the squirrel, and the ape. Its large and flat ears are like those of a bat; its principal peculiarity of structure is the middle toe or finger of the fore-foot, the two last joints of which are very long, slender, and denuded of hair. This member is useful to it in drawing worms out of holes in the trees, and it seems also to be of service in holding on to the branches of trees. It appears to be a subterranean animal, and does not see during the day; its eye resembles in color that of the owl. It is very slothful, but good-tempered, remaining generally at rest, and requiring a good deal of shaking to make it move. Its body is about a foot long. The subject of Sonnerat's observations he kept two months upon no other nourishment than cooked rice, and it fed itself with its two fingers, like the Chinese with their chopsticks. It never carried its tail elevated like the squirrel; it always hung dragging behind. The animal is rare, and seems to be regarded with a kind of superstition by the natives.

Genus GALEOPITHECUS.—The animals of this genus resemble the lemurs and the bats, having the general form of the first, and some of the qualities of the last. They have been called *Flying-lemurs*, *Flying-cats*, and *Flying-foxes*. They are found in the islands of Java, Sumatra, and Borneo, and live on trees, feeding on fruits, insects, and small birds. Swainson, speaking of



THE FLYING LEMUR, OR KABUNG.

one of these animals, observes: "To give its most striking characteristics in a few words, it is a lemur, with the limbs connected by a bat-like membrane, or, in other words, surrounded by a thin skin which they support, as the framework of an umbrella supports its covering. By this singular structure the animal is supported in the air; yet without the power, like the bats, of sustaining a continued flight." Like the flying-squirrels, it can sail a great distance from one tree to another, spreading out its membrane to serve as a parachute, but not as wings. It manifests great skill and energy in dropping from the upper limbs of the trees upon its prey below. It makes great havoc among the colibris, and other small birds, which throng the forests. Like the bats, it is nocturnal and insectivorous. The mammæ are pectoral. This animal sleeps suspended by the hind-legs, with its head downward.

Three species have been recorded, but recent investigations reduce them to one, *Galeopithecus volans*, called *Kabung* by the natives. The body is about twelve inches long. The female produces one young one at a time. This she places in a soft nest for four or five days; then it clings to her breast, and accompanies her in all her wanderings, till it is able to take care of itself.





HEAD OF ROUSSETTE BAT, THE KALONG—SIZE OF LIFE.



HEAD OF SPECTRE BAT—SIZE OF LIFE. (See p. 131.)



JAVELIN BAT – SIZE OF LIFE.

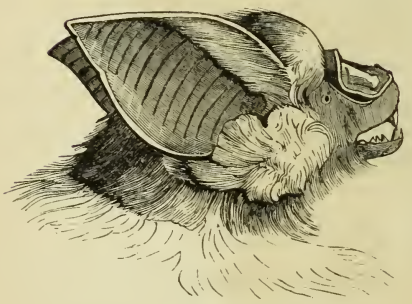
ORDER 3. **CHEIROPTERA.**

We now come to one of the most remarkable groups in the whole circle of animated nature—the *Cheiroptera.*

This order embraces the Bats, consisting of a great variety of species, spread over nearly every portion of the globe. In different countries they have different designations—all somewhat descriptive of their character and appearance. In England, they are sometimes called *Flitter-mice;* in France, their name is *Chauve-souris*, or *Bald-mice;* in Germany, they are called *Fleder-mauser*, or *Flying-mice.* They constitute the *Hand-winged* family, denominated *Vespertilio* by Linnæus—a name derived from the Latin, and signifying *bat.* Though possessed of a skeleton like that of quadrupeds, their fore-paws, or hands, are developed into long fingers, sustaining an exceedingly fine, thin, hairless, and semi-transparent membrane, on both sides of the body, which serves them as wings. Their flight is light, noiseless, and wavering, and less vigorous than that of birds; yet they turn hither and thither with great facility, and are thus able to pursue and catch insects—like themselves on the wing—which constitute their chief sustenance. All the family have four canine teeth, and some of them feed on small birds and small quadrupeds. Some kill and suck the blood of smaller bats; and Mr. Blythe says that in India the megaderms may be heard on quiet evenings crunching the heads and bones of frogs. Their legs, by means



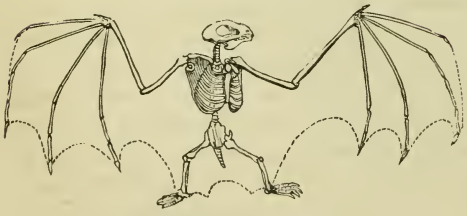
LONG-EARED BAT—SIZE OF LIFE.



RHINOLOPHUS NOBILIS—SIZE OF LIFE.



HEAD OF MEGADERM—SIZE OF LIFE.



SKELETON OF BAT.

of which they move easily on the ground, terminate in strong claws, which they use in clinging to the crevices of walls, rocks, and buildings: the thumbs are each furnished with a hook, which also answers the purpose of support in the hidden places they select for their abodes. In one large division of the family there is a curious leaf-like appendage on the nose, variously developed in the different species, whence they are called *Leaf-nosed Bats*. Some have the ears enormously expanded, and some have a prehensile power in the tail.

Though the bats are, upon the whole, useful rather than hurtful to man, they are creatures to which poetry and superstition have in all ages had recourse to deepen the feelings of loathing and horror. They are not only of strange forms, but they are things of the doubtful light—the dim twilight—which in ages of ignorance converts white stones into ghosts and bushes into specters. They dwell in the ruined wall, or riven earth, or gloomy cavern: in Eastern countries they often find their way into the sepulchres and catacombs of the ancients. They have been observed, therefore, as dwellers with desolation and death; and it was stretching the imagination but a little further to suppose that they were in league with these loathed and dreaded powers.

The rapacity of the larger bats, such as are found in the warm countries, feeding during the twilight gloom, gave color to these suppositions. Hovering about the Pagan temples, they ate greedily the blood and other remains of the sacrifices. When famine or pestilence, which were then of frequent occurrence, strewed the earth with the bodies of the dead, or when night closed upon the horrors of the battle-field, the bats thronged to the nocturnal feast. As in all cases they came dim and apparently formless, with wing most unlike any organ bearing the same name which is spread to the light of day, they perfected their claim of poetical alliance with the infernal regions, and the powers which hold dominion over them. Hence, as the peacock was the bird sacred to Juno, the queen of Heaven, so the bat became the creature sacred, or accursed, as it may be, to Proserpine, the empress of Hell.

The use of bats for these purposes is as old as Homer, who very skillfully manages them in heightening the graphic effect of the splendid passage in which he describes the shrieks and wailings of the ghosts in the regions of woe; and after Homer, all poets and painters who have ventured upon similar delineations have made use of the bats for the purposes of effect. Even to this day, painters must borrow the wings of bats for their devils, in the same way that they borrow the wings of doves for their angels; and



BATS OF EGYPT.

one has only to throw a deep Rembrandt shade over a piece of canvas, and show a bat's wing partly displayed from a cave, in order to give an infernal air to it, and make it, with very little painting, a good poetical representation of the gates of hell. It is easy to see how a race which is linked with such associations, should have had but a scanty measure of justice meted out to it by the half-superstitious naturalists of the Middle Ages; and a remnant of the same superstition is, no doubt, the cause of much of the horror which is still connected with some of the larger species of warm countries.

When we come to study the family of bats, however, in the light of natural history, not only does the traditional horror to which we have alluded vanish, but in their structure and habits we find much that is exceedingly curious. Their organs of sense are variously developed. The ears are in general large, and in some of the species they have a duplicature or second concha, as if there were one ear within the other. It is hence presumed that the sense of hearing is acute; and it may be that those which have the duplicature to the ears, have thus the means of closing up the auditory passage, so that they may not be disturbed in their repose during the day.

The eyes are very small, and deeply imbedded, something like those of moles; and though they must have the power of vision, it does not appear that they are essential to the animal in finding its way, even when it is intricate. Spallanzani suspended willow rods in a room in which he turned loose some bats which he had blinded; but though he frequently shifted these, so as to make the passage between them as varied and as intricate as possible, these creatures never struck against one of them, though they kept flying about in all directions. The same experiments have been made by others, and with a like result. The question has hence been raised as to the means by which bats contrive to avoid obstacles, and the same inquiry may be extended



BATS IN A CAVERN.

to very many other animals. A horse, in the dark, pauses when he comes to a closed gate, though he never was on the road before. Nocturnal beasts do not more frequently fall into pits and over precipices than beasts which are abroad during the day, and have their eyes to guide them; and nocturnal birds do not fly against trees any more than daylight birds. People, too, will keep a well-known path, though the night be pitch dark. The explanation of these cases has been sought in the supposition of a sixth sense, but as yet no satisfactory solution of such phenomena has been found.

The breeding of bats takes place at the very hottest time of the year. The young, which are usually two in number, are naked and helpless at their birth—capable only of clinging to the teats of their mother, which, however, they do with the greatest firmness and pertinacity. This habit to them is necessary, for the mother does not lie down, or even stand on the ground, when she suckles her young, as is the case with most of the mammalia. She hangs suspended by the nails of her thumbs, or more generally by those of her hind feet, to the branch of a tree, or some cranny or irregularity in a ruin or cavern. There is no nest in which she can leave the young ones when she goes out to feed, and thus she must bear them about attached to her body till they are capable of flight. The female has no marsupium; but this habit resembles somewhat that of the marsupial animals. The young are very immature when produced, and their nest and place of safety and repose is the body of their mother.

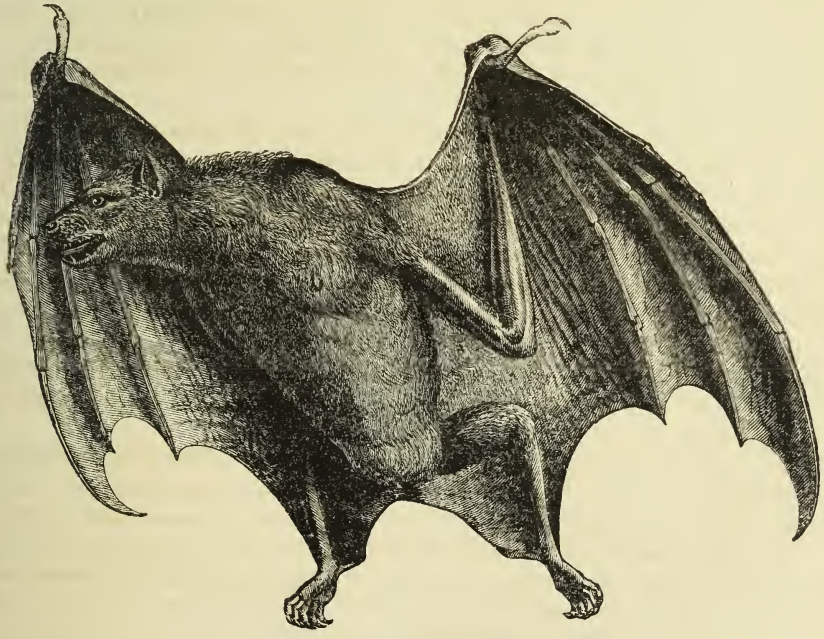
Some of the species occasionally fly during the day, but this practice is by no means common, and is confined to some of the foreign species, which are in part vegetable-feeders. In temperate climates, they conceal themselves during the day, even in the season of their greatest activity. Caverns, holes of trees, and walls and ruined buildings, are their retreats, and from these they issue forth as dusk begins to set in, flutter about in their laborious flight, and capture such insects as are then on the wing—gnats, musquitos, moths, and beetles,—their wide gape, with its formidable teeth, being an excellent trap for the capture of such prey.

The service which they render to vegetation by the destruction of insects, which in the larva state prey upon it, is very considerable, even in temperate climates. Some of the hot countries, in which these swarm by myriads, could not, but for them, be inhabited. In humid places, on the margins of tropical forests, musquitos are troublesome enough as it is, but if the bats did not



HORSE-SHOE BATS IN THE HOLLOW OF A TREE.

reduce their numbers, they would be utterly unbearable. Those species, too, which frequent the towns and settlements are useful in other respects. Most of the race are miscellaneous in their feeding, and not very delicate in their taste. They devour indiscriminately all animal substances, whether raw or dressed, and whether in a fresh or putrid state, thus removing a great deal of noxious and dangerous matter.



KALONG, OR ROUSSETTE BAT. —(See p. 129.)

So far, our account having reference to the bats with which we are acquainted in temperate climates, we have spoken of them as a gentle and useful race; but truth compels us to declare that there are, in far-off tropical countries, larger and more formidable creatures of this family.



BIG-EARED BAT.

In the island of Java, there are several species known by the name of *Roussette;* of one of them a portrait is given in the preceding page. They are very abundant, hanging in black rows or groups during the day, with their heads down and wings folded, on the trees. At evening, they take to their wings, and, guided by unerring instinct, resort to the gardens and plantations, where they seek the delicate fruits, such as melons, oranges, and even cocoa-nuts. In this way they do immense damage. So troublesome are they, that the inhabitants, in some places, are obliged to protect their fruit by loose nets or baskets of split bamboo.

In South America, there are several species of bat which have acquired the horrid name of *Vampire.* They live on the blood of animals, and usually suck while their victims are asleep. They are said to fan the unconscious sufferers with their wings, so as to lull them into more profound repose by a soothing coolness. The ears of horses and cattle, the combs and wattles of fowls, and the toes of men, are said to be their favorite points of attack. Nevertheless, the bodies of these creatures do not exceed six inches in length, though their wings stretch out to two feet; therefore the legends of their dangerous and destructive character are no doubt somewhat exaggerated.

It is probable that the larger bats, however, have given rise to some of the superstitions which appear in classical literature, as already suggested. The *Harpies*, which were flying creatures, with the faces of women, and the bodies, wings, and claws of birds, at the same time emitting a noisome stench and polluting whatever they touched, might very easily have been formed by popular imagination out of the more formidable species which no doubt once inhabited the southern portions of Europe, as well as the contiguous countries of Asia and Africa. The still more terrible myth of a demon which sucked the blood of persons during the night, and which acquired the name of *Vampire*, is very likely to have sprung from the stealthy performances of bats resembling those of South America. By a similar process, no doubt, the *Dragons*, *Basilisks*, *Wiverns*, and *Griffins*, which figure in the legends of the Middle Ages, were created from the crocodiles, serpents, and other animals which the Crusaders saw for the first time in their visits to the East. In

a rude age, the imagination needs little encouragement to convert objects so really curious and strange as those we have been describing, into hideous monsters, endowed with supernatural powers. It is the province of education and enlightened reason to reduce these horrid creations of fancy to the comparatively simple and innocent dimensions of truth.

The *Cheiroptera* may be divided into four families: First, the *Pteropodes*, or *Roussettes*, sometimes called *Fox-bats*, from the shape of the head; second, the *Phyllostomides*, or *Vampires;* third, the *Rhinolophides*, or *Horse-shoe Bats;* and finally the *Vespertilionides*, or *Common Bats* of Europe and North America.

THE ROUSSETTES, OR PTEROPODES.

The zoological name of the bats of the family *Pteropus* is derived from the Greek *pteron*, a wing, and *pous*, a foot. They are entirely confined to the warmer parts of the Eastern Hemisphere. They are most abundant in the islands of the Eastern Archipelago, whence the greater part of the species are derived; but they occur also on the main-land of Asia, in the tropical islands of the Pacific, in Africa, and even in Australia. They are the largest of the bats, the kalong of Java measuring



FOX, OR ROUSSETTE BATS.

no less than five feet in extent of wing, and the body two in length. They are frugivorous in their habits, and do great damage in gardens and plantations; but in confinement they have been known to eat the flesh of birds, so that it is possible they may vary their diet in a similar manner in a state of nature. They have a disagreeable odor, described by some observers as musky, by others as "mildewy." The flesh of some species is, however, eaten by the inhabitants of the places where they occur. It is probable that the bat which figures among the articles of food forbidden to the Jews, belonged to this group. Like the other bats, they are nocturnal animals, and pass the day suspended by the hind-feet from the branches of trees or the crevices of rocks; but some are known also to fly at noonday.

Genus ROUSSETTE: *Pteropus*.—Of this there are several species, generally destitute of tails. The KALONG, or EDIBLE ROUSSETTE, *P. edulis*, is so called because it is frequently used as food, being hunted for that purpose, and tasting, it is said, like rabbit. It is the largest of the bat family, the body being of the size of a small dog. Its color is nearly black. The museum of Leyden has possessed several specimens, sent from Java, Sumatra, and Borneo. These chiefly



MACROGLOSSUS.

distinguished themselves by ravenous appetites. A head of this extraordinary species is figured at p. 124. See also p. 127.

The Common Roussette, *P. vulgaris*, half the size of the preceding, is of the Isle of France and of Bourbon. They live chiefly on fruits, yet occasionally devour small quadrupeds and birds. They often fly by day, though the night is the usual period of their activity. They choose their abodes in the gloom of the thick forests, and only in the still watches of the night approach the habitations of man, when they devour large quantities of fruits in the gardens and plantations.

Besides these species, we may mention the following: The *P. funereus*, found in the same islands as the kalong; the *P. phaiops*, of Macassar; *P. chrysoproctus*, of Amboyna; *P. Mackloti*, of Timor; *P. alecto*, of Celebes; *P. pallidus*, of Sumatra and some of the adjacent islands; *P. personatus*, of the Moluccas; *P. griseus*, of Timor and Amboyna; *P. jubatus* or *P. Keraudrenii*, of the Philippines; *P. Tonganus*, of the Friendly Isles; *P. ursinus* and *P. dasymallus*, both of Japan; *P. Vanikoriensis*, of New Hebrides; *P. polyocephalus*, of Van Diemen's Land; *P. conspicillatus*, of Australia; *P. Dussumieri* and *P. Edwardsii*, of India; and *P. Stramineus*, of Sennaar and Senegal.

Genus MACROGLOSSUS: *Macroglossus.*—Of this there is only a single species, the Kiodote, or *P. minimus*, of Java and the adjacent islands. It is but three inches long, and is remarkable for the length of its protrusile tongue, which may be extended to two inches. It is called *Lowo-assu* by the natives, and as it exists in large flocks, is much dreaded on account of its devastations among the fruits of the gardens and plantations.

Genus EPOMOPHORUS: *Epomophorus.*—Of this there are two species, *P. Whitei* and *P. labiatus.*

Genus ELEUTHERURA: *Eleutherura.*—Of this the most noted species is the *P. Egyptiacus*, which has an expanse of wing of eighteen inches. It is doubtless the species figured on the monuments, and copied in the great work of Rosellini. It abounds in the ruins and is found even in the chambers of the pyramids of Egypt. The *P. Hottentotus* is another species of this genus, found in Southern Africa.

Genus CYNOPTERUS: *Cynopterus.*—Of this there is only the *P. marginatus* of Java and other Asiatic islands The four preceding genera are still included in *Pteropus* by many naturalists.

Genus MEGERA, *Megera*, offers only the species *M. ecaudata.*

Genus HYPODERMA, *Hypoderma*, includes but the species *H. Peronii*, of Timor and Amboyna.

Genus HARPYA, *Harpya*, includes only the species *H. cephalotes*, found in Celebes and Amboyna.



MEGADERM.—(See p. 132.)

THE VAMPYRES: PHYLLOSTOMIDÆ.

The term *Phyllostomidæ* is derived from the Greek *phullos*, a leaf, and *stoma*, the mouth, and in application to the bats of this family, means the *Leaf-mouthed*. They are, in fact, of that class which have a membraneous or leaf-like appendage upon the nose, as already described. The French call them *Fers de lance*, or *Spear-head* or *Javelin Bats*. The body of the largest of these animals is about six inches long; the wings have an expanse of two feet. They are peculiar to the tropical portions of South America, in some parts of which they are met with very abundantly.

Their favorite food appears to be the blood of the larger mammalia and birds, which they attack during sleep, and biting a small hole in the skin, suck the blood through it. Cattle and horses are very subject to their attacks, and appear frequently to lose a good deal of blood from the wound after the bats have taken their fill; but it seems probable that, unless an animal has been bitten severely in several places, the bite is rarely attended with ill consequences. Fowls, however, are said often to die from the effects of the bite.

Such animals as these, hovering about in the darkness, and drinking the blood of those they make their prey, and sometimes even leaving their victims to bleed to death, are calculated to inspire the imagination with horror. Hence exaggerated accounts of these creatures have been circulated. It has been said, as before stated, that they often attack men during the night by opening an artery and sucking the blood, lulling their victims the while with their long wings, until the loss of blood terminates in utter exhaustion. According to Azara, however, the inhabitants of Paraguay have no dread of these animals, although they frequently enter the houses, and suck the blood of those who may incautiously expose any part of their bodies; but he adds that, beyond a painful sensation, which lasts for some days, he never found any ill effects from their attacks. He states that they do not open any of the larger vessels, but merely make a small incision in the skin. Tschudi, the traveler and naturalist, however, mentions the case of an Indian who was bitten in the face by a species of this family, while sleeping in the woods in a state of intoxication; the wound, although apparently very slight, was followed by so much inflammation and swelling, that the man's features became quite unrecognizable.

Genus PHYLLOSTOMA: *Phyllostoma.*—Of this genus there are three species. The SPECTRE BAT, *P. spectrum*, the true type of the vampires, is six inches long, with two feet spread of wings. A head of the size of life is given at p. 123. The JAVELIN BAT, *P. hastatum*, and *Lophostoma sylvicolum*, are smaller. They are all addicted to the sucking of blood, but the spectre bat is the largest and most formidable.

Genus GLOSSOPHAGA: *Glossophaga.*—This term is derived from the Greek, *glossa*, the tongue, and *phago*, to eat, and is expressive of a peculiarity of the animals of this genus. They have a



THE RHINOPOMUS MICROPHYLLUS WALKING.

long, slender, and extensile tongue, thinly covered with hair, which they use in sucking the blood of their victims, by rapidly extending and retracting it in the incision they have made, thus vindicating their scientific name, which is equivalent to *tongue-eaters*. They are insectivorous, but yet are said to suck the blood of men and animals, as already described. They are found in Guiana and Brazil. The principal species are the *Glossophaga soricina; G. amplexicaudata; G. caudata;* and *G. ecaudata.*

Genus STENODERMA, *Stenoderma*, are noted for short or nearly rudimentary tails, a large short head, lips studded with warts, and a tongue adapted for suction. They are accustomed to suck the blood of sleeping animals. The best-known species are the *S. rufum; S. perspicillatum; S. lilium; S. lineatum; S. rotundatum; S. cavernarum;* and *S. Chilienses.*

Genus DESMODUS, *Desmodus*, have powerful incisor, as well as sharp cutting canine teeth: they have no visible trace of a tail. Their habits are little known, but they are supposed to resemble the preceding genus. The *Desmodus rufus*, extending across the warm parts of the South American continent, is the only known species.

THE RHINOLOPHIDES

This name, from the Greek *rhin*, the nose, and *lophos*, a crest, signifies *nose-crested*, and is applied to this family because of the membraneous appendages on their nose, giving them a singular and often forbidding appearance. They are peculiar to the Eastern Continent and Australia, and are very widely distributed. In England, where they are called *Horse-shoe Bats*, there are two species. They all have the anterior appendage surrounding the nostrils, this being somewhat of the shape of a horse-shoe. There are several species, which are of various sizes, the largest, the *Great Horse-shoe Bat*, being about two and a half inches long in the body. They are insectivorous, some of them feeding on cock-chaffers.

Genus MEGADERMA: *Megaderma.*—The animals of this genus are destitute of tails; the ears are so large as to unite in the middle; the nasal appendages have also a great development. Some of the species suck the blood of other bats, and some occasionally take a sip of the blood of frogs. The species are the *M. lyra*, found in India; the *M. frons* in Gambia; and the *M. spasma* in Java.

Genus RHINOPOMA: *Rhinopoma.*—The bats of this genus have a long, slender tail, without



NYCTERIS THEBAICA.

hair, looking like a sharp, jointed bone, which gives them a very curious appearance. The species are *R. microphyllus*, found in Egypt, and the *R. Hardwickii*.

Genus NYCTERIS: *Nycteris*.—In this genus both the tail and the interfemoral membrane are greatly developed, the ears are large but separate, and the nasal appendages are concealed. These bats have the skin of the body very loose, forming a sac, which communicates with the mouth by a small opening in each cheek: through these apertures the animal is able to puff out the body into the form of a ball; but the object of this arrangement is not known. The species are confined to Africa, except that they are found in Java. They are the *N. hispida*, of Senegal, *N. Thebaica*, of Egypt and Sennaar, and *N. Javanica*.

Genus RHINOLOPHE: *Rhinolophus*.—This is rather a numerous genus, scattered over Europe, Asia, and Africa; but none of them have been found in America. They are generally small, the largest having but fifteen inches of expanse of wing. The following are the principal species: *R. nobilis; R. diadema; R. insignis; R. speoris; R. bicolor; R. tridens; R. tricuspidatus; R. luctus; R. euryotis; R. trifoliatus; R. affinis; R. minor; R. pusillus; R. clivosus; R. unihastatus*, this being the Great Horse-shoe Bat; *R. bihastatus;* and *R. Commersonii*.

Genus NYCTOPHYLUS: *Nyctophylus*.—Of this there is but a single species, *N. Geoffroyi*, found in Australia. It is very small, and has two large ears, with a rudimental tail.

VESPERTILIONIDÆ.

We now come to a very numerous family of bats, including those with which we are familiar in our own country. Their generic name is derived from the Latin *vespertilio*, a *bat*. They are less formidable in appearance and habits than the roussettes, vampires, and others, which excite a species of disgust, if not of horror. They are destitute of the leaf-like appendage on the nose, which imparts such an aspect of ferocity. They are, in fact, small, harmless creatures, sleeping all the day in ruined walls, in caverns, and in the hollows of trees, and going forth at night to feast on insects, whereby they destroy many that are injurious to man. Those which live in tem-



THE GREAT HORSE-SHOE BAT.

perate climates go to sleep on the approach of winter, and hibernate till the warm season recalls them to activity.

Genus TAPHOZOUS: *Taphozous.*—Of this, the only well-established species are the *T. perforatus* and *T. longimanus*, both confined to the Eastern Continent.

Genus SACCOPTERYX: *Saccopteryx.*—This includes only the *S. lepturus*, found in Guiana.

Genus DICLIDURUS, *Diclidurus*, resembles the preceding.

Genus NOCTILIO: *Noctilio.*—These bats are of middle size, and are found in Central and South America. The Hare-lipped Bat, *N. leporinus*, and *N. lineatus*, are the only established species.

Genus VESPERTILIO: *Vespertilio.*—The species of this genus, though small, are very numerous. They are voracious, and devour an immense quantity of insects. A hundred flies and a dozen beetles are not more than the usual evening meal of one of the smallest kinds. They usually take their game on the wing; but sometimes they alight on the ground, where they walk very well, picking up grubs and caterpillars. They live in societies, gathering into dark places, such as crevices in walls, holes in trees, excavations in rocks, and dark and sheltered places in the eaves of houses and public buildings; they also inhabit chimneys where no fire is made. In the old stone edifices of Europe they often congregate by thousands. Their cry is sharp and feeble, and they are distinguished by a disagreeable musky smell. In captivity they become tame, and devour raw meat with avidity.

The *Oello Cuvieri*, *Vespertilio alecto*, and *Emballonura monticola*, are all of Eastern countries; the *Mystacina tuberculata* is of New Zealand. The *V. nigrita*, found in Western Africa, is a large species, having a body six inches long, and a spread of wing of eighteen inches. It was called the Flying Marmot by Daubenton. The *V. leucogaster* is of Kordofan, where it lives in the holes of the immense baobab-trees; the *Nycticeus viridis*, found in Mozambique, is of a green color; the *V. Borbonicus* is found both in the isles of Bourbon and Maurice; the *V. Belangeri* is of India; the *V. Temminckii*, of Java; the *V. noctulina*, of Bengal.

The *V. nigricans* is common in Italy; the *V. discolor*, in Austria. The *V. serotinus* is one of the largest of the European species. It dwells alone or in pairs in the forests, and in the country in the vicinity of water, finding shelter in the holes of trees. It does not issue forth till the darkness of night is complete. The *V. Barbastellus* and *V. noctula* are European species: the latter flies in small bands, and is noted for its disagreeable odor. The Pipistrella, *V. pipistrellus*, is a

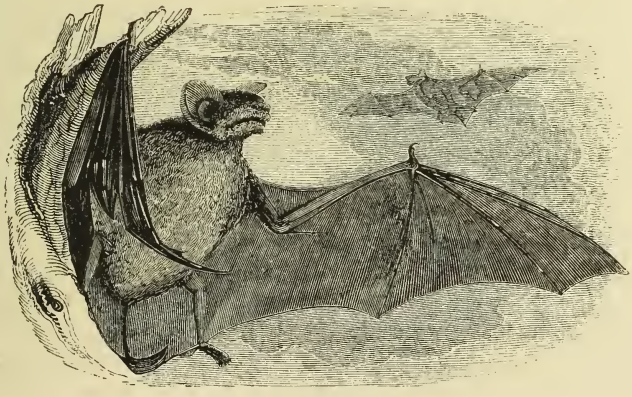


VESPERTILIO LIMNOPHILUS.

small and familiar European species, which the English call *Flitter-mouse*. It lives in towns and villages, and greatly resembles the common species of New England and the Middle States.

The *V. auritus*, or Lop-eared Bat, is a small species found in France, which lives apart in gardens and inhabited places. The *V. murinus* is a large species, found in Europe and also in Algeria. Other known species are as follows: *V. Beschteinii*, *V. Nattereri*, *V. mystacinus*, *V. emarginatus*, and *V. limnophilus*, besides some others not well established. Several Australian species, not well defined, are omitted.

The Big-eared Bat, *V. macrotis*, the *V. Euryotis*, *V. Blossevillei*, *V. Chiliensis*, *V. Brasiliensis*, *V. hypothrix*, *V. Isidori*, *V. lepidus*, and the *Plecotus volatus*, or *V. Maugei*, are South American species.



HOARY BAT.

The bats of our Middle States are all of the genus *Vespertilio*. In winter they retreat to holes in trees and rocks, and become perfectly torpid. They bring forth three to four at a birth. The New York Bat, *V. Noveboracensis*, is the most common species, extending its range from Massachusetts to Carolina, and from the Atlantic to the Rocky Mountains. It is covered with tawny hair, varied with white on the sides. The length of the body is three to four inches.

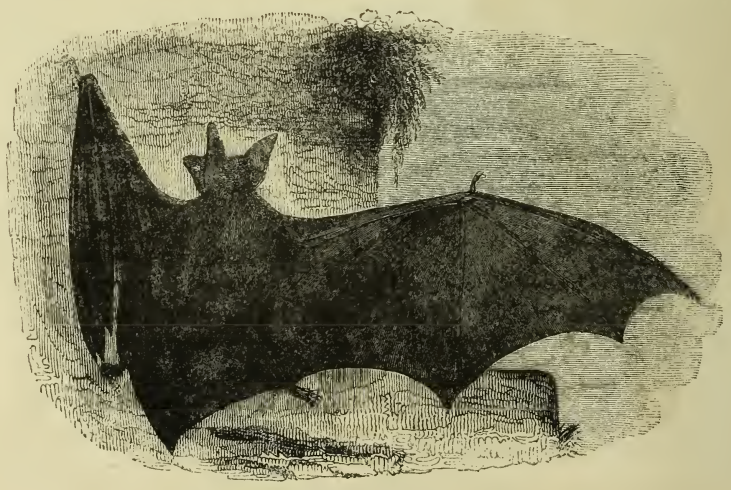
The Hoary Bat, *V. pruinosus*, is somewhat larger and more robust; the head is yellowish, and

the body blackish brown, with a grayish tinge given by long hairs tipped with white. It is the largest species of the Middle States, and often flies by day. It is thinly scattered over a very wide range. The other species of this region are the LITTLE BROWN BAT, *V. subulatus*, SILVER-HAIRED BAT, *V. noctivagans*, and CAROLINA BAT, *V. Carolinensis*. The *V. monticole* and *V. Virginianus* are found in Virginia and further South. There are several other bats found in the Southern States, but not of this genus. They are the *Molossus cynocephalus* and *M. fuliginosus*; the *Plecotus Lecontei* and *P. Townsendi*.



VESPERTILIO DISCOLOR.—(See p. 134).

Genus MOLOSSUS: *Molossus*.—The bats of this genus are remarkable for their large heads, round ears, thick lips, the upper one more or less fringed, and the saw-like form of their hinder fingers. They are hideous-looking creatures, flying with rapidity, and walking with more facility than most other bats. They are of middling size, and inhabit both torrid and temperate regions.



VESPERTILIO MURINUS.—(See p. 134.)

The species are as follows: The COLLARED BAT, *M. torquatus*, which has the external finger of its hinder feet set like an opposable thumb, found in Borneo; the *M. Daubentonii*, called the FLYING RAT, in Senegal; the *M. mops*, in Sumatra; the *M. plicatus*, in Bengal; the *M. Ægyptiacus*, in Egypt and the vicinity; and the *M. acetabulosus*, in the Isle of France. The *M. Cestoni* is found in Italy; the *M. ursinus*, *M. rufus*, *M. velox*, *M. obscurus*, and *M. nasutus* are of South America.





HEAD OF PETRODROME.—(See p. 142.)

ORDER 4. **INSECTIVORA.**

The order of *Insectivora*, or *Insect-Eaters*, includes several families, as follows: the *Tupaia*, the *Hedgehog* or *Erinaceus*, the *Gymnure*, the *Tanrec*, the *Elephant-mouse* or *Macroscelide*, the *Rhynchocyon*, the *Shrew* or *Sorex*, the *Solenodonte*, the *Desman* or *Mygale*, the *Chrysoclore*, the *Mole* or *Talpa*, the *Scalops*, and the *Condylure*.

The Insectivorous Mammalia, some of which are of exceedingly curious structure and habits, are readily distinguished from the Carnivora, with which, however, they are nearly allied, by the structure of their teeth. The skull is slighter and more elongated, the bones of the face and jaws being usually produced so as to form a muzzle of considerable length; the jaws are generally inferior in strength to those of the Carnivora. The form of the body, its clothing, and the development of the tail, vary considerably, but the legs are always short, so that the belly of the animal is raised but little above the ground; the feet are plantigrade, and generally furnished with five toes, of which the innermost is never opposable. The animals usually run upon the ground, sometimes dig beneath its surface, and sometimes ascend trees. An important distinction between them and the Carnivora is furnished by their possession of complete clavicles, which are always wanting or rudimentary in the latter. The mammæ are generally numerous, and always situated on the belly.

In the development of the brain and organs of the senses, they closely resemble the Rodentia, and this similarity is also frequently recognizable in their external form; so close is it, in fact, that many members of the present order are popularly confounded with the Rodentia, and the

same mistake has often been made by the older naturalists. Their food consists not only of insects and their larvæ, as might be supposed from the name given to the order, but also of worms and mollusca, and some of the larger species even devour the smaller vertebrate animals. They are generally—though not always—slow in their movements and nocturnal in their habits, and many of them pass the winter in a state of torpidity.



TUPAIAS

THE TUPAIAS.

Genus TUPAIA: *Tupaia.*—These are small animals, having somewhat the form and agility of squirrels. The head is long, the snout attenuated, eyes large and prominent, the claws sharp and hooked, the sole naked, the tail long, the body long and cylindrical, and covered with close, soft fur. These animals are the most elegant and graceful of all the insectivora: they are found in the great islands of Asia, and some are also met with in India.

The *T. Javanica*, called Banxring and Sinsring, seems most common at the eastern extremity of Java. It is of the size of a common squirrel, and greatly resembles it; its fur is close, silky, and delicate, with a few coarse hairs dispersed along the back, sides, and extremities: the upper parts are brown, slightly diversified with different shades of gray; the lower parts are a dirty white.

The *T. ferruginea*, almost wholly of a reddish-brown color, is fourteen inches long, including the tail, which is longer than the body. It is common in Sumatra, Java, and Borneo. Sir Stamford Raffles describes one that was tamed and allowed to go freely about the house, never failing to present itself at meal-time, when it partook of fruit and milk. Another species, the *T. tana*, found in the same region, is of a somewhat larger size. The *T. peguana*, found in the Birman Empire, and the *T. Elliotii*, found in Madras, are the other species.

Genus HYLOMYS: *Hylomys.*—Of this there is but a single species, the *H. suillus*, of Borneo. It is a small tupaia, with a rudimentary tail, nearly naked.

Genus PTILOCERCUS: *Ptilocercus.*—This also presents but a single species, the *P. Lowii*, which is found in Borneo, and has somewhat the face of the marsupials of Australia, with a very



PTILOCERQUE LOWII.

long tail, the first half naked, and the rest furnished with hairs like the barbs of a feather. It differs from the other tupaia in several points of its structure.

THE HEDGEHOGS

Genus HEDGEHOG: *Erinaceus.*—Although the hedgehog is not found in America, we have so often read accounts of it that it is as familiar to us as one of our own animals. The body is short, thick, and stout; the nose pointed, the tail short or entirely wanting, and the upper surface more or less covered with short spines, which, when the animals roll themselves up into a ball, as they



THE HEDGEHOG.

always do when alarmed or threatened, present an almost insuperable obstacle to any predaceous animal that might attack them. They are confined to the Eastern Hemisphere, where they are principally found in the milder regions, though they are common in England. They are noc-

turnal animals, sleeping during the day in holes under the roots of trees or stones, and coming forth at night in search of insects, fruits, and roots. Those which inhabit cold climates pass the winter in a state of torpidity. The female produces from four to six at a birth, in the month of June: these at first are of a rose-white. When of the size of a hen's egg, their prickles are well developed. The mother nurses them for a short time, and then leaves them to seek their fortune, which they are well able to do.

The common European hedgehog, *Erinaceus europæus*, is found in woods and hedgerows, and in England is not unfrequently kept in kitchens for the purpose of destroying cockroaches. It feeds freely upon almost all kinds of animal and vegetable matter, and kills and devours animals which none of the other insectivora would venture to attack, such as snakes, which it eats, according to Mr. Broderip, "as one would eat a radish," commencing at the tail and eating upward. It will even eat the insects called *Cantharides*, or *Spanish flies*, which would kill almost any other animal; but the hedgehog suffers no inconvenience from them. In illustration of the strength of the prickles in its skin, Professor Bell states that he has repeatedly seen a hedgehog belonging to himself precipitate itself down an area twelve or fourteen feet deep, and, by rolling itself up into a ball, arrive at the bottom without the least injury.

The other species are the Long-eared Hedgehog, *E. auritus*, and the *E. concolor*, found on the borders of the Black Sea; the *E. Grayi* and the *E. spatangus* of the Himalaya Mountains; the *E. nudiventris*, of Madras; the *E. collaris*, of India; the *E. Algirus*, of Barbary, and the *E. frontalis* and *E. Capensis*, of Southern Africa. The bones of hedgehogs are found largely in the fossil remains of Europe.



RAFFLE'S GYMNURE.

THE GYMNURES.

Of this family there is but a single genus, GYMNURE, *Gymnura*, and a single species, *Gymnura Rafflesii*, found in Sumatra. It is little known, but seems to possess more teeth than the hedgehog—that is, forty-four in number. It is nearly of the same size as that animal, but its body is more elongated. Its fur is soft, and of a grayish color: its tail is long, and nearly naked. Its formation is in several respects peculiar, and hence it has been placed among the viverrins by some naturalists, and among the marsupials by others. We follow Gervais in placing it next the hedgehogs, with which it seems to have the closest affinity.



THE TENDRAC.

THE TANRECS.

This family includes two genera, the *Tendracs* and the *Tanrecs*, both resembling the hedgehog, but not being capable of rolling themselves into a ball. They have no tail, are mostly nocturnal in their habits, and feed on insects. It is said that they lie dormant a considerable portion of the year, even though living in hot countries; but this is doubtful. M. Coquerel, surgeon in the French marine, says that he kept several of these creatures at Madagascar, during the hottest months of the year, the supposed period of their hibernation, and they remained active the whole time. Their spines are like stiff pointed bristles, and are by no means so strong as those of the hedgehog. It appears that they belong exclusively to Madagascar, and have not been found, even in a fossil state, in any other part of the world.

Genus TENDRAC: *Ericulus.*—Of this we know but a single species, *Ericulus spinosus*, which is about five inches long, and covered with spines resembling bristles. It is called *Tendrac* by the natives of Madagascar.

Genus TANREC: *Centetes.*—The true tanrecs have the body more elongated than the hedgehogs, and their bristles are less rigid, the spines being covered with soft, silky hair. The head is shaped like that of the marsupials. The *C. setosus* is found in Madagascar, and also in the islands of Bourbon and Maurice, but it was probably carried to the latter island by the colonists. It is tailless, about twelve inches long, and of a fawn color. The *C. armatus* has rather strong prickles, and is of a grayish-black color. The *C. spinosus* is little known. Other species have been mentioned, but they are not well established.

THE MACROCELIDES.

The animals of this family are confined to Africa, and consists of two genera. They are certainly very different from any of the preceding species, nor do they greatly resemble those that follow, but their insectivorous habits entitle them to a place here. They have long hind-legs, somewhat like the gerboas, rather large ears, long tails, and a remarkable long, proboscis-like nose. Some of the species are called *Elephant-mice* by the English, and the *Rat à trompe*, or *Proboscis-rat*, by the French. They inhabit dry, rocky places, and feed mostly on insects, but some devour other small animals, and even vegetables.

Genus MACROCELIDES: *Macrocelides;* called *Rhynchocyon* by some naturalists.—Of this



ELEPHANT-MICE.

there are several species. The best known is the *M. Rozeti*, found in Algeria. It is about four inches long, and has soft fur of a tawn color. It is easily tamed, and has frequently been carried to France, where it excited interest by its gentle manners and disposition.

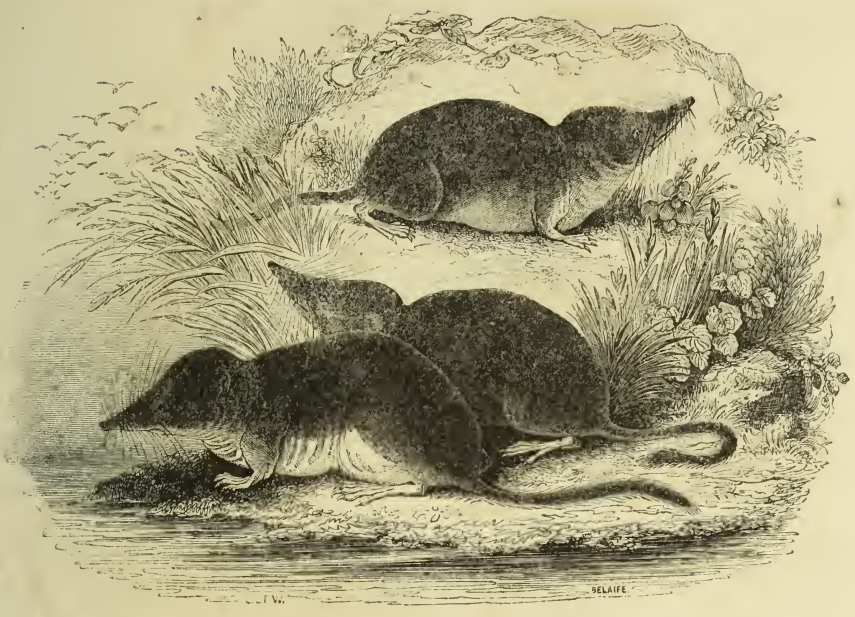
Several other species are mentioned, as *M. rupestris*, *M. intufi*, *M. brachyrhynchus*, *M. Edwardsii*, and *Rhinomys jaculus*. These are all of Southern Africa, in the region of the Cape and the Hottentot country. The *M. fuscus* is found in Mozambique.



RHYNCHOCYON.

Genus PETRODROME: *Petrodromus.*—Of this there is a single species, the *P. tetradactylus*, found in Mozambique. It is rather larger than the preceding, and has but four toes on the hinder feet. In other respects it resembles the true macrocelides.

Genus RHYNCHOCYON: *Rhynchocyon.*—Of this genus Gervais makes a separate family. The only species is the *R. Cernei*. This has but four toes on each foot, is nine inches long, has an elongated body, and a proboscis nose covered with flexible hair. It is of a reddish-brown color, and is found in Mozambique.



SHREWS.

THE SHREWS: SORICIDÆ.

The family of *Shrews*, which is very numerous in species, have the feet all formed for progression; that is to say, the anterior members are never converted into organs appropriated for digging. The eyes are always perfect and readily distinguishable, and the external ears, though small, are always present. In other respects, the different animals composing this group exhibit a remarkable variety of character; the dentition presents considerable differences even in closely allied species: the length of the legs and tail, and the clothing of the body, are also very variable. They all, however, agree in living either on the surface of the ground or upon trees, and never in a complicated system of burrows, such as that of the moles; their jaws are always more or less elongated, and the nose is usually prolonged into a movable snout. The *soricidæ* are found in all parts of the world; they are of small size, and their nourishment consists principally of insects, although some species also feed on vegetable matter.

Genus SHREW: *Sorex*.—In the typical shrews, forming the genus *Sorex* and its allies, the form of the body presents a close resemblance to that of the mice and rats, whence the name of *shrew-mice* is frequently applied to the common species. Their legs are of nearly equal length, and terminate in five toes, which are armed with small claws, and usually free, though not unfrequently united by a swimming membrane. The nose is more or less produced, and the tail is elongated, usually tapering, covered with scales like that of the mice, and with a greater or less number of bristles. The skin is clothed with short fur. Some of these are among the most diminutive of the mammalia, and the largest of them are about the size of a rat. They are generally furnished with peculiar glands, secreting a fluid of a disagreeable odor, which prevents cats and dogs from eating them, although they will not unfrequently kill them, probably mistaking them for mice. They live for the most part upon insects, worms, and small mollusca; the larger species also prey on small vertebrata.

The Common Shrew, *S. araneus*, the most familiar European species, is about two and a half inches long, and of a gray fawn-color. Its food consists of insects and worms. It inhabits the woods, the country, and gardens, making its retreats in old walls, heaps of stones, and holes in the earth, and is frequently found near hay-ricks, dung-hills, and similar places. On the approach of winter, it gathers near the abodes of man. It is subject to an annual mortality; about August, they are found dead in great numbers—a fact not satisfactorily accounted for. Though dogs and cats will



WATER-SHREWS.

not eat these animals, on account of their musky smell, kestrels and owls are known to prey upon them.

Shrews are very pugnacious: if two be confined in a box together, but a very short time elapses before the weaker of the two is killed and partly devoured. Their nest, which is formed of soft grasses and other plants, is generally found in a hole more or less shallow, in the ground, or a dry bank, and is entered at the side, being, so to speak, roofed over. Here the female produces in the spring from five to seven little shrews.

Among the ancients, the shrew-mouse had a very bad reputation. Thus Aristotle declares that its bite is dangerous to horses and other beasts of burden; and that it is more dangerous if the animal be with young. The bite, he says, causes boils, and these burst, if the shrew-mouse be pregnant when she inflicts the wound; but if she be not, they do not burst. Pliny states that the bite of the Italian shrew-mouse is venomous. Agricola tells us that its bite in warm regions is generally pestiferous, but that in cold climates it is not,—consoling those who may suffer by it that the animal itself, torn asunder or dissected and placed upon the wound, is a remedy for its own venom. It is difficult to account for such widely extended prejudices. It appears that even to our English ancestors this graceful and harmless little animal was also an object of fear and superstition.

The *S. crassicaudus* is of a larger size than the preceding, and found in Egypt. It seems to have been one of the sacred animals of Ancient Egypt, for it is found among the preserved mummies in great numbers. As these are at least three thousand years old, and the skeletons are precisely similar to those of the species now existing, and as this fact coincides with others, naturalists draw the inference that the form and structure of most animals are permanent, or at least subject to small modifications. There were probably several other species of sorex thus religiously preserved by the Egyptians.

The *S. flavescens*, of the Cape of Good Hope, is white, tinged with fawn; the *S. herpestes*, *S. cyaneus*, *S. capensoïdes*, and *S. gracilis*, are of the same locality; the *S. Etruscus* is found in Italy and France, and is a very diminutive species, not over an inch and a half long. A similar species is found in Algeria. The *S. Perrottetii*, very small, is found in the lofty plateaux of India, near Pondicherry. A similar one, *S. Madagascariensis*, is found in Madagascar. The *S. myosurus*, or Rat-tailed Shrew of India, is differently named by different authors; it is noted for its intense musky odor. In India there are other species of shrew, of which little is known. One is called *S. giganteus* by Geoffroy, and F. Cuvier speaks of one under the name of *S. Montjourou*.

Of the *Water Shrews*—embraced under the generic name of *Hydro-sorex* by some authors—there are several species. The *S. fodiens*, the COMMON WATER-SHREW of Europe—the *Musaraigne d'eau* of the French—is of a dark chestnut-color, and about four inches long. It lives on the borders of small streams, and swims about in pursuit of insects, worms, small shell-fish, and even frogs and lizards. It is an exceedingly pretty animal, and swims with admirable grace and dexterity. The *S. tetragonurus* is common in France, and various parts of Europe; the *S. Alpinus* is found in Switzerland; the *S. pygmæus* is found in Germany and the adjacent countries. This last, and the *S. gracilis*, *S. Etruscus*, *and S. Madagascariensis*, are the smallest known mammifers.

There are several species of sorex found in the United States. DE KAY'S SHREW, *S. De Kayi*, is a small species, of a glossy slate-color, with a short tail; the feet are flesh color; length of head and body about five inches. It extends from New England to Virginia. The SHORT-TAILED SHREW, *S. brevicaudus*, resembles the preceding. It is found in Connecticut and the adjacent territories. FORSTER'S SHREW, *S. Forsteri*, is found in Canada and New York. The *S. Carolinensis* and *S. cinereus* are Southern species; the *S. Richardsoni*, SAY'S LEAST SHREW, *S. parvus*, *S. Cooperi*, and the MARSH SHREW, *S. palustris*, are found in the northwestern territories. The FRINGE-FOOTED SHREW, *S. fimbripes*, is found in Pennsylvania.

The BROAD-NOSED SHREW, *Otisorex platyrrhinus*, is of a dark-brown color, and four inches long, and seems to be an aquatic species. It is found in New York and the adjacent States. The LONG-NOSED SHREW, *O. longirostris*, is of a chestnut color, and found in South Carolina. The *Sorex personatus* is another species, little known.

It will be understood that the *shrews* are distinct from the *shrew moles*, which are American animals, and will hereafter be described.



UROTRICHUS TALPOIDES.

THE SOLENODONTES.

These animals have the appearance of the shrews, but their teeth are more numerous, and of somewhat different structure. They naturally occupy a place between the shrews and desmans. There are two genera.

Genus SOLENODONTE: *Solenodon.*—Of this there is a single species, *S. paradoxum*, found in Cuba and St. Domingo. It is seven inches long, and of a yellowish-gray color.

Genus UROTRICHUS: *Urotrichus.*—Of this there is one species, the *U. talpoides*, which is three inches long, and found in Japan.



THE DESMAN OF THE PYRENEES.

THE DESMANS: MYGALE.

This family resemble the shrews, but live in the water, and are larger, and use the tail as a sort of oar. On account of the odor they diffuse from the glands in the tail, they are called



THE RUSSIAN DESMAN.

Musk-rats, but they must not be confounded with the *Musk-rat* or *Ondatra* of the United States, which we shall hereafter describe. The nose is prolonged into a trunk, somewhat flattened; the

feet, especially the hind ones, are palmated, and suited for swimming. They feed on insects, shell-fish, frogs, and fish. Their eyes are small, and the ears rudimentary.

Genus DESMAN: *Mygale.*—The *M. Pyrenacia*, found in the Pyrenees, is about five inches long: its color is a brownish fawn above and grayish beneath; its claws are strong, and its musky odor very decided.

The RUSSIAN DESMAN, *M. Moscovitica*, is seven inches long, of a brown color, and is still more strongly scented. The fish that devour it are penetrated with its odor. The musk is collected and sold to some extent as a perfume. This animal is found in the Volga and the adjacent lakes.



THE CHRYSOCHLORIS AUREA.

THE CHRYSOCHLORIS.

Genus CHRYSOCHLORIS.—These curious animals, about three inches long, are exclusively African. They have a chunky body, small eyes, no external tail, ears nearly rudimentary, short legs, and strong fore-feet, fitted for burrowing. The hind-feet have four claws, and the fore ones but three. The hair is distinguished by a rich metallic luster, which has given them the name of *Golden Moles*. They live almost wholly in the ground, which they perforate with as much facility as the true moles.

There is only one genus, but there are several species,—the *C. aurea*, *C. villosa*, *C. Hottentota*, *C. Damarensis*, and *C. obtusirostris*, all of the southern and southeastern parts of Africa.

TALPIDÆ: MOLES.

Genus MOLE: *Talpa.* In the *Talpidæ*, or Moles, the whole structure evidently points to their strictly subterranean habits. The body is short and thick, and supported upon short and strong legs; the head is produced into a long muzzle; the eyes are either so small as to be detected with difficulty, or completely concealed beneath the skin; and the external ears are entirely deficient. The internal ear is very perfect, and the olfactory organs are highly developed, so that those senses which must be most valuable to animals confined to a subterranean existence, are possessed by them in the greatest perfection, while the sense of sight, which is comparatively useless to a creature which passes the greater part of its time in utter darkness, is almost entirely suppressed. The tail is usually short, or quite rudimentary.

For the excavation of the galleries which these animals make in pursuit of insects and worms, and in which they almost constantly reside, their anterior limbs, although short, are exceedingly powerful, and so arranged as to form most efficient instruments for digging. In the common



FORE-FOOT OF THE MOLE. HIND-FOOT. HEAD OF MOLE.

mole of Europe, the bones of the arm are very short and strong, and the limb is terminated by a broad, flat, and shovel-like hand, armed with long and strong claws, furnished with a curved prolongation of one of the carpal bones, called the *falciform bone*, which gives additional strength to the hand, and is so placed that its palm is naturally turned directly backward. By the agency



THE COMMON MOLE.

of these digging hands, the mole burrows with great rapidity, and the galleries which it forms are of a very complicated nature.

The Common Mole, *T. Europæa*, is found in most parts of Europe, and is well known for its curious cylindrical form, and the blackness of its velvet-like coat. Its eyelids are open, and it has been proved by experiment to have the power of sight, although it is a popular belief that the mole is quite blind: this, indeed, is the case with another species, inhabiting the south of Europe, *T. cæca*, which is supposed to be the mole referred to by those ancient naturalists from whose statements the charge of blindness has been applied to this species.

Although the greater part of this animal's labor in digging is undoubtedly expended in the pursuit of food, a portion of his excavations are of a more permanent nature, serving for his regular residence, and as a high road leading from this to different parts of the district which he has appropriated. His residence consists of a large hillock of earth, firmly beaten together, and placed in some secure situation; within this are two circular galleries, one above the other, and communicating with each other; the chamber inhabited by the animal is excavated in the center of the lower gallery, and communicates with the upper one by three short passages. From

the bottom of the chamber runs another passage, which descends for a certain distance and then rises again toward the surface, until it falls into the high road leading from the residence to the creature's hunting-ground; this also communicates with the lower gallery, and forms one of about nine tunnels, which issue from all parts of the latter, and which are said by the French naturalists to open again into the high road at various distances.

The high road is much larger than any of the ordinary tunnels made by the mole in searching for his prey, which open out from it in various directions, and its object evidently is to give the animal a free and rapid communication with his fortress: in fact, an experiment performed in France proved that the speed with which a mole, when alarmed, traversed the course of his main tunnel was nearly equal to that of a horse at full trot. The depth at which the road is made varies according to circumstances: in ordinary situations, it is rarely more than four or five inches; but in passing under a road, or any other place where it is exposed to much pressure, the animal will carry its burrow to the depth of a foot or more.

While burrowing in search of food, the mole frequently comes to the surface, where it makes an opening, and through this the earth, loosened in its excavations, is got rid of; it forms the little heaps well known in the fields and meadows as mole-hills. It is a most voracious animal, and a very short fast is fatal to it; in fact, when two individuals in captivity are not sufficiently supplied with food, the weaker is always killed and devoured by the stronger one. In winter, the mole continues active, but in severe weather, usually seeks its food at a greater depth in the ground; in the summer, on the contrary, it frequently quits its abode at night, and hunts for insects and worms on the surface. It swims well, and often takes to the water, sometimes for self-preservation when its retreats are invaded by floods, sometimes in changing its abode when its course is stopped by a rivulet, and occasionally, according to some writers, for the mere pleasure of taking a bath. It is a fierce little creature, and bites severely when incautiously seized. The males also have sanguinary and fatal combats in the season of their amours.



THE COMMON SHREW-MOLE.

THE SCALOPS, OR SHREW-MOLES.

Genus SCALOPS.—The family of *Scalops*, or *Shrew-Moles*, belongs exclusively to North America. In their dentition they are closely allied to the shrews and desmans, and in their form and habits to the true moles. The latter animals are not found in the United States; the shrew-

mole takes its place, and is popularly regarded as a mole. These curious little creatures are familiar to every gardener and farmer in the Northern and Middle States, by their paths and galleries in the earth, the traces of which are visible in little mounds on the surface. Gifted with powerful fore-paws for digging, and a sharp, muscular, tough, and flexible nose, it can bore its way in the soft soil with amazing celerity. The name given to the tribe, *Scalops*, from the Latin, *sculpo*, *I scrape*, indicates its leading characteristics. One of these creatures will sometimes make a course of a hundred feet in a single night! Their food consists chiefly of earth-worms, and these they pursue, emboweled in the soil, with the same energy and activity that other animals seek their prey above ground. It is a general idea in the country that they devour the vegetables, and hence they are objects of persecution with the farmer: the damage they do, however, is very slight, consisting only in disturbing the soil, and occasionally uprooting a few plants, and not in eating them.

This animal furnishes one of those instances of happy adaptation of means to ends, in which the works of nature abound. Its form is cylindrical, its neck stout and short, its head tapering to a point,—all suiting it to its mining operations in the soil. Its eyes are exceedingly minute, and imbedded in fur, so as to shield them from the dirt in which it works. Its fur is thick and compact, in order to protect the body from the cold and dampness, and every hair is of a glossy polish to repel the earth and mud with which it comes in contact. Add to this, what has been already mentioned, the gimlet nose, and the stout, strong, shovel-shaped paws, and we see a little, energetic, skillful miner, endowed by nature with all the tools needful for success in life. He seems condemned to toil and darkness, but, in point of fact, what are these but sources of enjoyment, when they lead him to a perpetual feast? If, as sometimes happens, he chooses to peep out from his burrow, and to take a night-scamper over the sod, his little eyes dilate and give him all the vision that he needs or wishes. Truly viewed, the shrew-mole, apparently condemned to a dark and dirty existence, is a happy example of a thrifty and contented housekeeper and a very model of personal cleanliness.

The Common Shrew-Mole, *Scalops aquaticus*, or *S. Canadensis*, is about six inches long, which is the size of the European mole. The fur is like velvet, and of a silvery brown, almost black; the snout and palms are of a pinkish flesh-color. Sometimes these creatures are seen running rapidly along on the ground, but soon dive into one of the openings of their burrows. Although frequently perforating new paths, they still have galleries which are permanent avenues, in some of which they have soft nests of dried grass and leaves for their young. When two rival moles meet, they sidle up at each other like two pigs, and after a short tussle one gets the better of the other, and punishes him with his teeth.

The period of activity for this little creature is the warm season. It does not become absolutely torpid in winter, but seems only to live a more retired and sedentary life at that period. Though its scientific name of *aquaticus* indicates that it is of aquatic habits, such is not the case, as its whole life is spent on the land. This is one of those names given under mistake, and persevered in because it has become common.

This species is found from Canada to the Southern States. Four others are known;—the Black-clawed Shrew-Mole, *S. Æneus*, is of a brassy brown, and is almost as brilliant as the chrysochloris: it is found in Oregon. The Silvery Shrew-Mole, *S. argentatus*, greatly resembling the *S. aquaticus*, though nearly twice as large, is found in Michigan. Townsend's Shrew-Mole, *S. Townsendii*, is equal in size to the preceding, but has eight more teeth than the *S. aquaticus*, and is found in Oregon. The Texan Shrew-Mole, *S. latimanus*, is found in Mexico and Texas. Brewer's Shrew-Mole, *S. Breweri*, is a little larger than the *S. aquaticus*, and is of a glossy, cinereous, black color. Under the breast there is a slight tinge of brown. It is found from Massachusetts to Virginia.

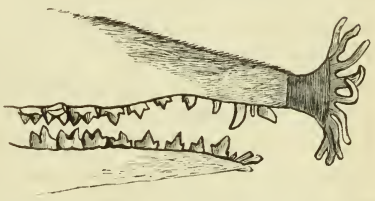
THE CONDYLURES.

Genus CONDYLURE: *Condylura*.—Of this there is but a single species, the Star-nosed Mole, *C. cristata*, distinguished for its star-like, membraneous process on the nose. It is confined to North America, and is thinly scattered over the country from Hudson's Bay to



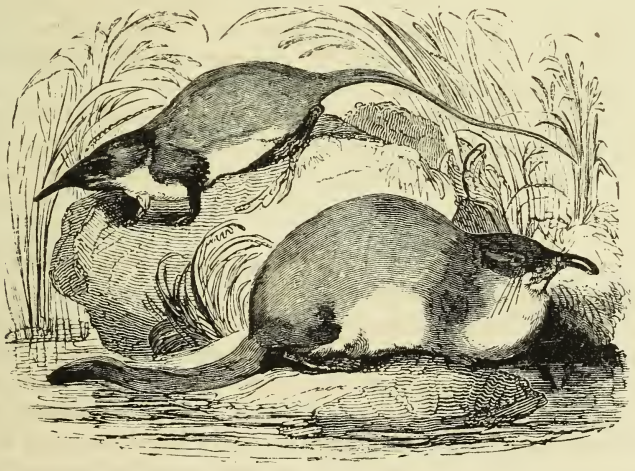
THE STAR-NOSED MOLE.

Virginia. In the United States it is sometimes called *Button-nosed Mole.* Its length is five inches; its color nearly black; the nose and feet, flesh-color. It burrows in moist places like the shrew-mole, though rather deeper, and has, like that animal, chambers for rearing its young. It is most numerous near the borders of streams, its food, like that of the mole, consisting of worms and insects. When observed in confinement, it continually attempts to hide itself by digging, and the cartilaginous tendrils around the nose are in perpetual motion. In that state it eats all kinds of flesh readily, and shows no disposition to feed on vegetables.



SNOUT OF THE C. CRISTATA, ENLARGED.

The *C. macroura*, described by Richardson and others as a distinct species, is thought by Dr. DeKay to be the same as the one above described.





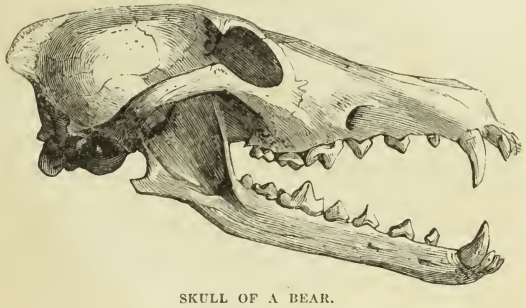
LION, TIGER, AND LEOPARD.

ORDER 5. **CARNIVORA.**

The term *Carnivora*, signifying *Flesh-eaters*, is applied generally to creatures that feed on animal substances; hence it is often used to include not only the Carnivora proper, but the two orders Cheiroptera and Insectivora. We, however, restrict the order to the various animals in which the thirst for blood has its highest development, including the following families: The *Ursides*, or Bears; *Viverrides*, as the civets, genets, &c.; *Canides*, as dogs, wolves, foxes, &c.; *Felides*, as the lion, tiger, and cat kind generally; *Hyenides*, or Hyenas; and *Mustelides*, or the weasel kind.

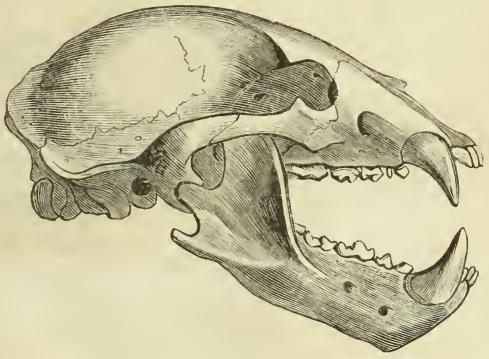
The Carnivora are all true quadrupeds, living on the land, though some of them are arboral in their habits. The teeth are variable, but generally the molars show, by their compressed form and sharp cutting edges, that they are intended for the division of flesh. All three kinds of teeth are always present. The incisors are small, six in number, and placed in a transverse row across the front of the mouth; the canines are always of a large size, conical, curved, and

acute, especially in the most decidedly carnivorous species, where they are so long that there is usually a gap between the incisors and canines in the upper jaw, for the reception of the lower canine. Behind the canines, each jaw bears several false molars, the foremost of which are usually conical, and inserted by a simple root. The hinder ones gradually approach the form of the true molar, which is more or less compressed, sharp, and notched at the edge: this is commonly known as the *flesh-tooth*. Behind it there are often one or two tuberculous molars.



SKULL OF A BEAR.

In the cats and the most blood-thirsty species in general, the false molars are compressed and sharp, and the total number of molars is often reduced to three, which are all inserted by two or more roots, much compressed, and furnished with very sharp jagged edges, fitting against one another like the blades of a pair of scissors—an arrangement admirably adapted for cutting through the juicy fibers of the flesh of their victims. In proportion as the animals are intended for a mixed diet, the molar teeth become broader, and more tuberculate in their appearance; this may be seen in the common dog, which is thus enabled to eat grass. To give effect to these sharp, cutting teeth, the lower jaw in the typical Carnivora is articulated to the skull by a regular hinge joint, and the transverse position of the condyle is distinctly perceptible even in the less rapacious species, although to a certain extent modified. The ascending ramus of the lower jaw, which gives attachment to the muscles by which the jaws are closed, is always very large, especially in the typical species.



SKULL OF A WOLF.

The skull and face are short and compact; the former is usually marked with very strong ridges, for the attachment of the muscles of the lower jaw, and the zygomatic arches are very wide to allow of their passage. The orbits are incomplete. The brain and organs of sense are always well developed; the nose especially, in many species, exhibits a greater degree of perfection than in any other animal. The eyes are usually large and full, and the pupils possess a great power of contraction and dilatation to adapt the creatures for their general nocturnal mode of existence. Nearly all the species possess a distinct external ear. The mouth is surrounded with soft lips, from which long whiskers project on each side; these are supplied with nerves, and evidently constitute delicate tactile organs. The tongue is always long, thin, and free, and the animals drink by the well-known process of lapping. The mammæ, which are always placed on the belly, are usually numerous, and many of the animals are very prolific. The young are usually born blind.



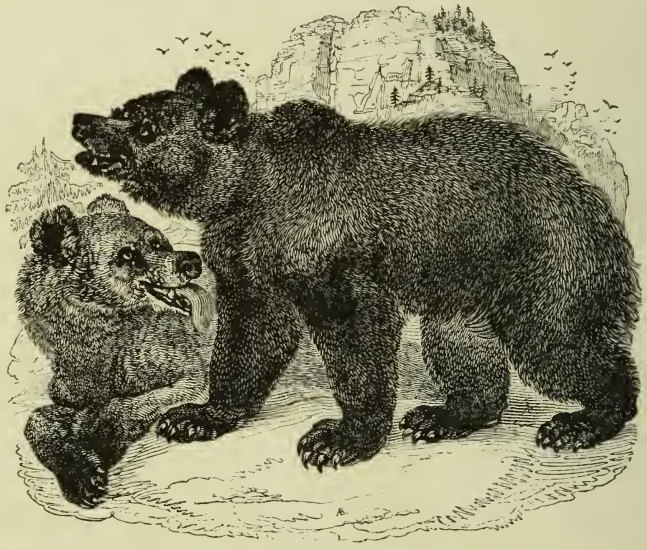
SKULL OF A CIVET.

The form of the body, the development of the tail, the length of the legs, and the structure of the feet, vary greatly in the different families of this order. The toes are distinctly divided, and armed with claws; they are usually five in number on the anterior, and four on the posterior feet, and none of them are ever opposable. The principal peculiarities in the construction of the feet have reference to the mode in which they are applied to the ground, and as this is in direct

connection with the habits of the animals, and always corresponds with other important characters, the differences observed in the structure of these extremities are of great value in the discrimination of the families, and have even been employed in the primary division of the order into groups.

The most predaceous species are possessed of extraordinary activity; their bodies are light and muscular; their legs are long, and their short toes alone are applied to the ground: they walk, as we should say, on tip-toe, and they are accordingly called *Digitigrada.* Those species which are intended for a more or less vegetable diet, are heavier and endowed with far less agility; their toes are longer, and they apply the whole foot, including the metatarsus and tarsus, to the ground in walking: these are denominated *Plantigrada.* These two groups, however, shade off almost insensibly into one another, and some naturalists have proposed the formation of an intermediate group, containing those Carnivora in which a portion of the sole is applied to the ground, under the name of *Semi-plantigrada.*

Among the fossil remains of animals, those of various species of Carnivora are abundant, especially those of the bear and hyena. The bones of the latter have been discovered in heaps in the caverns of Northern Europe, thus showing that in some remote geological era, the climate of that part of the world was adapted to animals essentially tropical in their nature and habits.



EUROPEAN BEAR.

THE BEARS: URSIDÆ.

Genus BEAR: *Ursus.*—Of the bears there are many kinds, varying greatly in some of their characteristics; we shall, however, notice them in one group. They are found in various parts of the world, yet no species is met with in Australia, and it has not been ascertained to exist in Africa. Cuvier held that it was not a native of that country; but Ehrenberg says: "We ourselves have seen in the mountains of Abyssinia, and therefore in Africa itself, an animal most like to a bear, and hunted it repeatedly, but in vain. It is called by the natives *Karrai.*" He then goes on to state, that he can give to those who are interested in the geographical distribution of the bear, "true tidings of a blackish, plantigrade wild beast most like unto a bear," in the mountains of Abyssinia. It seems probable, therefore, that a species of bear is a native of the high mountainous regions of Eastern Africa.

In Asia and in Europe, as well as America, the species are widely distributed. The positive qualities of these beasts were likely to make them objects of attention, and hence we find them spoken of in the histories of remote ages. The she-bears which came out of the wood, "and



EUROPEAN BEAR.



tare forty and two" of the mockers of Elisha, 2 Kings ii. 24, are probably the first bears on record. These bears of Syria may be occasionally traced in subsequent history. Thus Matthew Paris, in his "England," relates how Godfrey, as he was riding for recreation in a neighboring wood during the siege of Antioch, saw a poor stranger, who was loaded with a bundle of dry wood, flying from an enraged bear; whereupon Godfrey gallantly went to the rescue, and the bear turning upon him he was unhorsed, the horse being wounded by the bear; so he fought on foot, but, after a severe struggle, in which he received a most dangerous wound, he buried his sword up to the hilt in his savage adversary, and killed him. The historian, in continuation, relates the joy of the army at Godfrey's recovery. Long before this, Aristotle had correctly described the bear as "an omnivorous animal, which, by the suppleness of its body, climbs trees and eats the fruits and vegetables. It also devours honey, having first broken up the hives; crabs, too, and ants it eats, and also preys upon flesh." He then accurately describes how the animal attacks the stag, the boar, and even the bull. A more modern writer, the author of a "Tour on the Prairies," gives a similar description of the bear's love of honey, though in terms not quite so classical. "The bear," he says, "is the knowingest varmint for finding out a bee-tree in the world. They'll gnaw for a day together at the trunk, till they make a hole big enough to get in their paws, and then they'll haul out honey, bees, and all."

Although the bear has long been extirpated from England, the brown species was once indigenous there. Two or three centuries ago it was imported for baiting, a sport in which the nobility, and even royalty itself, delighted. A bear-baiting was one of the recreations offered to Queen Elizabeth in her celebrated visit to Kenilworth. In Southwark, about the same time, there was a regular "bear garden," which disputed popularity with the Tower and Globe theaters. There was, and perhaps still is, a custom in the city of Oxford, to carry, on Christmas Day, a bear's head crowned with a wreath, before a procession. The origin of this is said to be that, in ancient times, that is, in the age of bears, a professor of the university, walking in the forest and reading Aristotle, was met by a bear, who set upon him with his mouth wide open. Upon this, the professor rammed the book into his throat, saying, "*Eat it, it is Greek!*" Whether the animal survived, we are not informed.

In the early history of New England, the bears make a conspicuous figure, and from the earliest times it seems to have shared with the wolf the privilege of being employed by nursery maids to scare children into obedience. It is, however, rarely a dangerous animal to man, excepting our American grizzly bear, even in his native forests. Some of the species are the



GRIZZLY BEAR.

pets of menageries, especially in Europe, and not unfrequently they have been taught to dance and tumble in a manner exceedingly amusing to the spectators. The bear is almost as much a humorist, in his way, as the monkey, and the odd contrast between the gravity of his looks and the drollness of his capers is irresistibly ludicrous.



MARTIN CLIMBING HIS TREE.

In the Garden of Plants, at Paris, there are two deep pits, walled in and railed around, in which there are several bears, black, brown, and white. These are objects of the liveliest interest to visitors, and especially the children. The huge beasts will lie down, roll over, assume a begging posture, make funny faces, and play many pranks, for the petty boon of pieces of cake or bread thrown to them. Sometimes one of them will climb up the trunk of a dry tree planted in the middle of the fosse. Such a feat generally secures him a cake worth a sou.

Some years since, one of the bears in this collection was, if we may use the expression, one of the *lions* of Paris. His name was Martin, and as all the people of Paris were freely admitted to the Garden, everybody became acquainted with him. During the hours of exhibition, the

railing of the bear-den was thronged with men, women, and children, and the cry of "Martin! Martin!" was heard on all sides. The creature knew his name, and at the call, performed his various feats of grimacing, tumbling, and attitudinizing. But this was not his only claim to celebrity. Some hard stories were told about him, one of which was as follows: The night sentry, looking down into the fosse while the bear was asleep in his lair, observed in the flickering light what he thought was a twenty-franc gold piece upon the stone floor. He got a ladder and went down, but was disappointed to find that the supposed coin was a brass suspender-button. He uttered a cry, upon which the bear, aroused from his slumber, descended in his usual agile manner, and made a hearty meal upon the unfortunate veteran! This is as the story was told, but the fact was, that the man was found dead in the morning, with Bruin sitting by him. He probably fell from the ladder, and was killed outright in the fall. However, the affair made a tremendous sensation in Paris, and one of the ballads composed upon the event, has obtained a place in the permanent popular literature of France.

In general, bears are heavy animals, and strictly plantigrade in their walk, which is awkward and shuffling; the anterior limbs are, however, possessed of great mobility, and many of them manifest much dexterity in climbing. Their feet are armed with long curved claws, with which they dig in search of roots and other articles of food. Their bodies are usually covered with long shaggy hair, the tail being remarkably short. The ears are small, and the nose is more or less produced and movable, in some species forming a sort of proboscis.

Bears are generally inhabitants of the wooded districts in mountainous countries. They feed principally upon vegetable substances, such as roots and berries; they also devour worms and insects, especially ants; and now and then make a meal upon some of the smaller Mammalia, when these come in their way. Their partiality for honey has been already mentioned; in some places they manifest a fondness for fish. Bears are hunted principally for the sake of their skin and fat; the latter being extensively used as an application to the hair. Their flesh is eaten, and the broad paws are regarded as a dainty morsel; the hams, when cured, are also in great repute. Some of the species lie in a dormant state during the winter season.

The Brown Bear, *Ursus Arctos*, is the *Ours* of the French, *Orso* of the Italians, *Bär* of the Germans, *Björn* of the Swedes. It is the common bear of Europe, and is widely diffused. The mountainous districts of Europe, from very high latitudes in the north, to the Alps and Pyrenees in the south, Siberia, Kamstchatka, and even Japan, to the eastward, and a portion of the northern regions of America, form the range of its geographical distribution.

To the Kamstchatkans this bear seems to furnish the necessaries and even the comforts of life. The skin, we are told, forms their beds and their coverlets, bonnets for their heads, gloves for their hands, and collars for their dogs; while an overall made of it, and drawn over the soles of their shoes, prevents them from slipping on the ice. The flesh and fat are their dainties. Of the intestines they make masks or covers for their faces, to protect them from the glare of the sun in the spring, and use them as a substitute for glass, by extending them over their windows. Even the shoulder-blades are said to be put in requisition for cutting grass.

The Laplanders hold it in great veneration, and call it the *Dog of God*. It appears that there has long been among the Norwegians a proverb, that the bear has the strength of ten men and the sense of twelve. They never presume to call it by its proper name of *Guouzhja*, lest it should revenge the insult on their flocks; but make mention of it as *Moedda-Aigja*, the *Old Man with a Fur Cloak*. These superstitions remind us of those respecting the bear among our North American Indians.

The brown bear is four to five feet in length by two and a half in height. It is a solitary animal: its retreat during the period of hibernation is the natural hollow of a tree, or some cavern; and if these are not to be found, the animal constructs a habitation for itself, sometimes by digging, sometimes by forming a rude kind of hut or den with branches of trees, lined with moss. Here it retires when fat with the summer's food, and remains dormant, without taking any sustenance, till the ensuing spring. The period of gestation is about seven months, the birth taking place in January. The cubs when first born are not much larger than puppies. The animals are long lived, for it appears that one at Berne had been confined there thirty-one



THE JUNGLE BEAR.

years; and another is spoken of at the age of forty-seven, in the menagerie at Paris. They are excellent swimmers, notwithstanding their uncouth appearance.

From the accounts which have been furnished, it would appear that the bears of Norway are not much inferior in size and ferocity to the grizzly bear of our country. The she-bear of that region is represented as especially formidable when she has occasion to defend her cubs. In cases of danger, she drives them into the trees for safety; this she sometimes effects with so much violence that their cries may be heard a considerable way off; she then retreats to some distance. This is a sure token that she means to defend her cubs, and it is then very dangerous to approach them unless the hunter is first freed from the mother, who is sure to attack him with

fury. A peasant of Dalecarlia, one day, in a forest, fell in with a young bear, which had taken refuge in a tree. This he shot at, and brought the cub to the ground; but his triumph was of short duration, for its cries soon attracted the mother, all savage with rage, to its rescue. Having discharged his gun, he was quickly overpowered, and desperately bitten in several places. He would inevitably have lost his life, had not the bear at length severely wounded herself upon the long knife which he carried attached to his girdle. Feeling the pain, she turned from him, and spying her cub on the ground, which now lay dead, she took it up in her mouth, and bore it off, to the no small relief of her antagonist.

The Black Bear of Europe, *Ursus Niger Europæus* of Cuvier, is now generally regarded as a variety only of the preceding species. The *Bear of the Pyrenees* or of the *Asturias*, whose young are of a yellowish white, with black feet, is also supposed to be a variety of the same.

Asia can boast of several species of bear. The Siberian Bear, *U. collaris*, resembles the brown bear, but has a white band passing over the shoulders to the breast. The *U. Thibetanus*, found in the Himalayah Mountains and in Japan, has a thick neck, a flat head, large ears, a compact body, clumsy limbs, and rather weak claws. It is black, of moderate size, and very much resembles the European bear. The *U. Isabellinus* is found in the Himalayah range. A specimen in the Zoological Gardens of London was nearly white, and it is conjectured that it may be a variety of the Arctic bear.

The *U. Syriacus*, no doubt the species spoken of in the Bible and already alluded to, is of a fulvous white, varied with tawny spots. Two fine specimens have been in the Zoological Gardens. The *U. labiatus*, the Big-lipped or Sloth Bear—also called the Jungle Bear, the Five-fingered Sloth, Sloth Bear, and Ursine Sloth—inhabits the mountainous parts of India. It is of the size of the brown bear, and has a most uncouth—nay, even a deformed appearance. Its back is humped, the limbs short, the head depressed. The nose is capable of extension, and the lips are protrusile. The fur is long and shaggy, of a black color, with brown spots. Under the neck and on the breast is a white mark. It lives in caverns, and feeds on fruits, honey, and white ants. In captivity it is mild but melancholy. A pair were kept for some time in the gardens of the Zoological Society. They lived very sociably, and often lay huddled together, uttering a kind of rattling but low whine, or purring, which was continuous and monotonous, but not entirely unmusical; indeed, by more than one who heard it, it was termed their song. The paw was generally at the mouth when they made this noise.

The Malayan Sun Bear, the *Bruang* of the Malays, *U. Malayanus*, is jet black, with the muzzle of a yellowish tint, and has a semilunar white mark upon the breast. Its appetite for delicacies is extremely keen. The honey of the indigenous bees of its native forests is supposed to be a favorite food; and certainly the great length of the tongue is well adapted for feeding on it. Vegetables form its chief diet, and it is said to be attracted to the vicinity of man by its fondness for the young shoots of the cocoa-nut trees, to which it is very injurious. It has frequently been taken and domesticated. In confinement, it is mild and sagacious. Sir Stamford Raffles thus describes the manners of one which appears to have been deservedly a great favorite:

"When taken young," he says, "they become very tame. One lived for two years in my possession. He was brought up in the nursery with the children; and, when admitted to my table, as was frequently the case, gave a proof of his taste by refusing to eat any fruit but mangosteens, or to drink any wine but champagne. The only time I ever knew him to be out of humor was on an occasion when no champagne was forthcoming. He was naturally of an affectionate disposition, and it was never found necessary to chain or chastise him. It was usual for this bear, the cat, the dog, and a small blue mountain bird, a lory of New Holland, to mess together and eat out of the same dish. His favorite playfellow was the dog, whose teasing and worrying were always borne and returned with the utmost good-humor and playfulness. As he grew up, he became a very powerful animal, and in his rambles in the garden he would lay hold of the largest plantains, the stems of which he could scarcely embrace, and tear them up by the roots."

The Bornean Bear, the *Helarctos euryspilus*, differs from the Malayan bear principally in having a large orange-colored patch, deeply notched at its upper part, upon the chest. In size

it is supposed to be rather less. An individual which was exhibited in the Tower of London measured along the back from muzzle to tail three feet nine inches. It was obtained in Borneo when very young, and during the voyage, was the constant associate of a monkey and other animals. In confinement, its manners greatly resembled those of the Malayan bear. Its habits in a state of nature do not appear to be known. Dr. Horsfield, speaking of it in captivity, says: "The *Helarctos* readily distinguishes the keeper, and evinces an attachment to him. On his approach, it employs all its efforts to obtain food, seconding them by emitting a coarse but not unpleasant whining sound. This it continues while it consumes its food, alternately with a low grunting noise; but if teased at this time, it suddenly raises its voice and utters at intervals harsh and grating sounds. It is excessively voracious, and appears to be disposed to eat without cessation. When in a good-humor, it often amuses the spectators in a different manner. Calmly seated in its apartment, it expands the jaws, and protrudes its long and slender tongue. It displays on many occasions not only much gentleness of disposition, but likewise a considerable degree of sagacity. It appears conscious of the kind treatment it receives from its keeper. On seeing him, it often places itself in a variety of attitudes to court his attention and caresses, extending its nose and anterior feet, or suddenly turning round, exposing his back, and waiting for several minutes in this attitude, with his head placed on the ground. It delights in being patted and rubbed, and even allows strangers to do this; but it violently resents abuse and ill treatment; and, having been irritated, refuses to be courted while the offending person remains in sight." The individual whose manners are here described fell a victim to its voracity. During the hot weather in the summer of 1828, it overgorged itself one morning, and died within ten minutes after the meal.

We now come to the *American Bears*. The most formidable animal upon this continent, and the only one that in general attacks mankind, is the Grizzly Bear, the *U. ferox* of Lewis and Clark, who first accurately described it; the *U. horribilis* of Say, and the *Meesheh Musquaw* of the Cree Indians. Its length is from six to nine feet; its weight from four hundred to eight hundred pounds. In form it resembles the European bear. Its fore-claws, which are much curved, measure six inches. This part of its organization is well adapted for digging, but not for climbing, and the adult grizzly bear does not ascend trees, although the young ones frequently do. The muzzle is lengthened, narrowed, and flattened, and the canine teeth are highly developed. The tail is very small, and so entirely lost in the hair which covers the haunches, that it is a standing joke among the Indian hunters, when they have killed a grizzly bear, to desire any one unacquainted with the animal to take hold of its tail. The hair is abundant, long, and varying through most of the intermediate gradations between yellowish gray and blackish brown, which last is prevalent, and more or less grizzled. It is difficult to find two specimens alike in their color. The young are generally black, or nearly so. On the muzzle, the hair is pale and short; on the legs, it is darker and coarser. The eyes are small, and rather sunk in the head.

The haunts of this animal are the Rocky Mountains, and the plains to the eastward of them. They are also common in California, and are met with in the northwestern British territories as far as latitude 61°. They generally seek the marshy districts, thickly covered with trees and bushes, among which they have their lairs. They ramble about in search of food both by night and day. In general, their aspect and manner are in the highest degree savage and morose, but it appears from the accounts of travelers that the almost universal love of fun implanted in the animal creation invades the breasts of these horrid monsters. The young grizzlies, we are told, when they deem themselves alone in their solitary abodes, have their bo-peep, leap-frog, and wrestling as well as other bears, and sometimes the gruff and gnarled old fathers and mothers lend their countenances to these sports. Their diet consists in part of wild plums, buffalo-berries, and other vegetable dainties; but flesh is their chosen food. Any animal they can seize falls a prey to their voracity. The young ones, and the she-bears with young, hibernate: the older males ramble about during the winter as at other times.

Unwieldy as this animal appears, it is capable of great rapidity of motion, and its strength is overpowering. The bison contends with it in vain. The conqueror drags the enormous carcass,



THE GRIZZLY BEAR.

weighing often a thousand pounds, to a chosen place, digs a pit for its reception, and repairs to it till the exhausted store compels him to renew the chase. Yet he will be satisfied with fruits and roots; but on his diet depends the aggravated or mitigated ferocity of his disposition. This animal is very tenacious of life: one has been known to receive fifteen bullets before he was killed. The long, hooked claws are strung into necklaces, and are highly prized by the Indians as trophies of their prowess. The following account of the habits of the grizzly bear is given by Sir John Richardson:

"A party of voyagers who had been employed all day in tracking a canoe up the Saskatchewan had seated themselves in the twilight by a fire, and were busy in preparing their supper, when a large grizzly bear sprang over the canoe that was tilted behind them, and seizing one of the party by the shoulder, carried him off. The rest fled in terror, with the exception of a metif named Bourasso, who, grasping his gun, followed the bear as it was retreating leisurely with its prey. He called to his unfortunate comrade that he was afraid of hitting him if he fired at the bear, but the latter entreated him to fire immediately, without hesitation, as the beast was squeezing him to death. On this he took a deliberate aim, and discharged his piece into the body of the bear, which instantly dropped its prey to pursue Bourasso. He escaped with difficulty, and the bear ultimately retreated to a thicket, where it was supposed to have died; but the curiosity of the party not being a match for their fears, the fact of its decease was not ascertained.

The man who was rescued had his arm fractured, and was otherwise severely bitten, but finally recovered. I have seen Bourasso, and can add that the account which he gives is fully credited by the traders resident in that part of the country, who are best qualified to judge of its truth from their knowledge of the parties.

"I have been told that there is a man now living in the neighborhood of Edmonton House, who was attacked by a grizzly bear, which sprang out of a thicket, and with one stroke of its paw completely scalped him, laying bare the skull, and bringing the skin of the forehead down over the eyes. Assistance coming up, the bear made off without doing him further injury; but the scalp not being replaced, the poor man has lost his sight, although he thinks his eyes are uninjured.

"Mr. Drummond, in his excursions over the Rocky Mountains, had frequent opportunities of observing the manners of the grizzly bears, and it often happened that in turning the point of a rock or sharp angle of a valley he came suddenly upon one or more of them. On such occasions they reared on their hind-legs, and made a loud noise like a person breathing quick, but much harsher. He kept his ground, without attempting to molest them; and they on their part, after attentively regarding him for some time, generally wheeled round and galloped off; though, from their known disposition, there is little doubt but he would have been torn in pieces had he lost his presence of mind and attempted to fly. When he discovered them from a distance, he generally frightened them away by beating on a large tin-box in which he carried his specimens of plants. He never saw more than four together, and two of these he supposes to have been cubs; he more often met them singly, or in pairs. He was only once attacked, and then by a female for the purpose of allowing her cubs to escape. His gun on this occasion missed fire, but he kept her at bay with the stock of it until some gentlemen of the Hudson's Bay Company, with whom he was traveling at the time, came up and drove her off.

"In the latter end of June, 1826, he observed a male caressing a female, and soon afterward they both came toward him, but whether accidentally or for the purpose of attacking him, he was uncertain. He ascended a tree, and as the female drew near, fired at and mortally wounded her. She uttered a few loud screams, which threw the male into a furious rage, and he reared up against the trunk of the tree in which Mr. Drummond was seated, but never attempted to ascend it. The female in the mean while, retiring to a short distance, lay down, and as the male was proceeding to join her, Mr. Drummond shot him also. From the size of their teeth and claws, he judged them to be about four years old."

The following account of the manner of hunting the grizzly bear in California is alike curious and interesting. It must be understood that a bear has been previously baited, and a party of some half dozen friends invited to the sport:

"Every thing being prepared, men, horses, saddles, and lassoes, they all start at sunset or dusk, and keep carefully to windward of the bait, which must be placed on a piece of ground clear from rocks, trees, or bushes, and within about eight hundred yards of one of these, for the purpose of hiding themselves, that the bear may not see them when he is approaching the bait. A horse that has been catching bears three or four times will keep a strict watch for the approach of the bear at the bait, and will invariably let the rider know—not by any noisy motion, but by deep suppressed sighs, and pricking up his ears.

"Whenever one or more of the horses do this, the men who have been lying by on foot, mount as quietly as possible, and when all are ready with their lassoes in their hands, ready to swing, they put spurs to their horses, which at that moment is very little needed, that noble animal appearing to all intents and purposes to be as anxious as his rider to capture the savage animal. The horse, being swifter than the bear, if the plan has been well laid, is sure to overtake him before he can get to any bush. The foremost rider throws his lasso, and seldom fails of catching the bear, either by the neck or around the body or one of its legs. Should he miss, there are several more close at his heels to throw their lassoes. As soon as the bear finds himself fast, he rears and growls, taking hold of the lasso with his two fore-paws. At this crisis, the lasso must always be kept tight; if not, the bear will extricate himself immediately.

"Now comes in play the sagacity of the noblest of animals. The horse, from the very moment

the bear is lassoed, keeps his eye on every movement, and appears to do, or rather I believe actually does do, all in his power to protect and defend his rider as well as himself; as it often happens, that from carelessness or inattention on the part of the rider, the bear will entangle the horse's legs with the lasso, and in such cases, if it is a horse that has been used to lassoing bears, he will with the greatest agility clear himself, without the least motion from the bit. I have several times seen a horse, when the bear has been approaching him from before, instead of turning round to run away or to run on one side, wait until the bear got close to him, watching him all the time with a steady eye, and all of a sudden take a leap right over the bear, and then turn suddenly around and face him again. This feat of course is only done by such horses as are well acquainted with bear-hunting.

"I never was in either a military or naval engagement myself, but I have heard hundreds say that fear exists in the breasts of warriors no longer than till the first volley is fired. The same may be said of the horse in bear-hunting. From the moment a horse sees the bear, it matters not at what distance, he begins to tremble, and his heart beats so loud that his rider can distinctly hear it. But this lasts no longer than the first momentary onset; for as soon as the horse feels by the strain of the lasso that the bear is lassoed, his fear leaves him, and he is from that moment in the highest glee. If the bear is a very large one, two or three more persons will throw their lassoes on him, because an old bear will be very apt to take the lasso in his mouth and bite it off, or bring such a strain on it as would break it.

"The bear being now well secured, with three or four lassoes on him, the horses, arching their necks and snorting with pride at their prize, walk away with the savage animal, which is rearing, plunging, and growling.

"This method of hunting the bear is one of the noblest diversions with which I am acquainted. It requires an extraordinary degree of courage for a man to ride up beside a savage monster like the grizzly bear of this country, which is nearly as active as a monkey, and whose strength is enormous. Should a lasso happen to break, which is often the case, the bear invariably attacks the horse; and it requires very often the most skillful horsemanship to prevent the horse or its rider from being injured. It requires also great skill to know when to tighten the lasso, and to what degree, to prevent it from being suddenly snapped by too sudden a strain. The rider must have his eye constantly on that of the bear, and watch his every motion. Sometimes, either through fear, carelessness or inadvertence, a man may let go his lasso. In this case, another, if the bear takes off, will go as hard as his horse can run, and, without stopping his speed, will stoop from his saddle and pick the end of the lasso from the ground, and, taking three turns around the loggerhead of his saddle, and checking his horse's rein, again detain the bear.

"In short, from the moment that a person arrives at the spot fixed upon to lay wait for the bear's coming to the bait, until he is fast to a tree or killed, he feels himself elated. Every motion of those noble animals, the horses, which seem as though they were doubly proud when they feel the strain of the lasso from the saddle, and appear to take as much delight in the sport as the riders themselves, is grand beyond any power of description."

The Rocky Mountains, and the plains to the eastward of them, particularly the districts which are interspersed with open prairies and grassy hills, are the chief haunts of the grizzly bears. To the north, they have been observed as far as latitude 61°, and it is supposed that they are to be found still further.

The Black Bear, *U. Americanus*, is somewhat smaller than the *U. Arctos;* the head is narrower, the ears more distant, the muzzle more prominent, and the claws longer and more hidden in the hair. The fur is black, and consists of smooth, soft, and glossy hair, instead of the shaggy and woolly locks of the European species. The cheeks are of a fawn-color, and a stripe of this sometimes descends to the chest. In some cases, these animals are of a yellowish, and sometimes of a cinnamon color, which has given them the name of *Cinnamon Bear*, *Yellow Carolina Bear*, &c. The tail is very short, the claws short and blunt, and the whole form thick and clumsy. The black bear originally inhabited nearly every wooded district of the North American continent; from Panama to the Arctic regions, and from the Atlantic to the Pacific, it is still common in all

the less settled countries, with the exception of California, where it seems to be replaced by the grizzly bear. It is occasionally met with in the mountainous parts of Maine, New Hampshire, and Vermont: in the uninhabited wooded regions of New York, New Jersey, and Pennsylvania it is common.

The total length of an adult of this species seldom exceeds six feet. Its favorite food appears to be berries of various kinds, but when these are not to be procured, it preys upon roots, insects, fish, eggs, and such birds or quadrupeds as it can surprise. It does not eat animal food from choice, for when it has abundance of its favorite vegetable diet it will pass the carcass of a deer without touching it. Its haunts are in the gloomy forests, its chief happiness seeming to consist in solitude. Its aspect is eminently savage and morose, and even when partially domesticated, it does not appear to have the sociable and humorous qualities of the European bear. It is a timid animal, and will seldom face a man unless it is wounded, or has its retreat cut off, or is urged by affection to defend its young. When resident in the fur countries, it almost invariably hibernates, and about one thousand skins are annually procured by the Hudson's Bay Company from black bears destroyed in their winter retreats. It generally selects a spot for its den under a fallen tree, and, having scratched away a portion of the soil, retires to it at the commencement of a snow-storm, when the snow soon furnishes it with a close, warm covering. Its breath makes a small opening in the den, and the quantity of hoar frost which occasionally gathers round the aperture often serves to betray its retreat to the hunter.

In more southern districts, where the timber is of a large size, these bears often shelter themselves in hollow trees. The Indians remark that a bear never retires to its den for the winter until it has acquired a thick coat of fat; and it is remarkable that when it comes abroad in the spring it is equally fat, though in a few days thereafter it becomes very lean. The period of the retreat of the bears is generally about the time when the snow begins to lie on the ground, and they do not come abroad again until the greater part of the snow is gone. At both these periods they can procure many kinds of berries in considerable abundance. In latitude 65° their winter repose lasts from the beginning of October to the first or second week of May; but on the northern shores of Lake Huron, the period is from two to three months shorter. In very severe winters, great numbers of bears have been observed to enter the United States from the northward. Like the deer and bison, they change their haunts with the season, but it is not true, as has been asserted, that they generally abandon the northern districts on the approach of winter; the quantity of bear-skins procured during that season in all parts of the fur countries being a sufficient proof to the contrary. The females bring forth about the middle of January; the number of cubs varies from one to five.

During the spring months, this bear lives on succulent plants along the margins of lakes and ponds; in summer, it secludes itself in the gloomy swamps, where it feeds on roots, nettles, fish, and small mollusca. Occasionally a stray pig, calf, or cow diversifies its bill of fare. One of its great pleasures is to wallow in the mud like a hog. Sometimes it makes a foray into the cornfields, where it causes great havoc. As autumn advances, nuts, acorns, grapes, berries and mast become its food. About the same time, many a bee-tree is ravaged of its honey to feed this avaricious and greedy brute. At this season it roams the woods alone, occasionally embracing the trunk of a tree with its arms, tearing the bark with its paws, and clashing its teeth till the foam gushes from the mouth—as if to keep itself in training for the chase—and then goes on its way.

The young bears are not much bigger than kittens at the time of their birth. They lie carefully hidden in some cave or hollow tree till they are able to go forth. They are sportive creatures, full of pranks,—running, leaping, wrestling, and playing hide-and-seek, like a parcel of boys. The young cubs are indeed as harmless and sportive as puppies. The hunters tell us that they often go off and hide themselves, to tease their anxious mothers. After a time the undutiful cubs come back grinning and leering, and seem to think it an excellent joke. If captured early, these creatures may be trained to a certain degree of tameness, and may be taught many tricks —though, as before remarked, they are less docile than the European bears.

The black bear, in spite of his clumsy shape, wallops over the ground with great speed. If closely pursued by dogs, it climbs a tree, but descends and gives battle on the approach of the

hunters. A blow of its huge paw will lay the largest dog dead in an instant. It is an object of keen pursuit by the hunter and trapper, as well on account of its skin, which is greatly prized, as for the love of the chase. Scarcely a season passes that the villagers of Maine, and even the northern parts of Vermont and New Hampshire, are not invited to this sport by the visits of these animals within their precincts, coming from the north as winter approaches.

The Indians, though they kill and eat the bear, by a strange apotheosis, regard the Bear Spirit as one of their divinities, before whom they perform wild dances, and other ceremonies, by way of propitiation. An instance of this kind of superstition is furnished by Mr. Henry, who gives the following curious account:

"In the course of the month of January, I happened to observe that the trunk of a very large pine-tree was much torn by the claws of a bear, made both in going up and down. On further examination, I saw that there was a large opening in the upper part, near which the smaller branches were broken. From these marks, and from the additional circumstance that there were no tracks in the snow, there was reason to believe that a bear lay concealed in the tree. On returning to the lodge, I communicated my discovery, and it was agreed that all the family should go together in the morning to assist in cutting down the tree, the girth of which was not less than three fathoms. The women at first opposed the undertaking, because our axes, being only of a pound and a half weight, were not well adapted to so heavy a labor; but the hope of finding a large bear, and obtaining from its fat a great quantity of oil, an article at the time much wanted, at length prevailed.

"Accordingly, in the morning we surrounded the tree, both men and women, as many at a time as could conveniently work at it; and there we toiled like beavers till the sun went down. This day's work carried us about half way through the trunk, and the next morning we renewed the attack, continuing it till about two o'clock in the afternoon, when the tree fell to the ground. For a few minutes every thing remained quiet, and I feared that all our expectations would be disappointed; but, as I advanced to the opening, there came out, to the great satisfaction of all our party, a bear of extraordinary size, which I shot. The bear being dead, my assistants approached, and all, but particularly my 'Old Mother,' as I was wont to call her, took the head in their hands, stroking and kissing it several times; begging a thousand pardons for taking away her life; calling her their relation and grandmother; and requesting her not to lay the fault upon them, since it was truly an Englishman that had put her to death.

"This ceremony was not of long duration, and if it was I that killed their grandmother, they were not themselves behindhand in what remained to be performed. The skin being taken off, we found the fat in several places six inches deep. This, being divided into two parts, loaded two persons; and the flesh parts were as much as four persons could carry. In all, the carcass must have exceeded five hundred weight. As soon as we reached the lodge, the bear's head was adorned with all the trinkets in the possession of the family, such as silver arm-bands, and wrist-bands, and belts of wampum, and then laid upon a scaffold set up for its reception within the lodge. Near the nose was placed a large quantity of tobacco. The next morning no sooner appeared than preparations were made for a feast to the manes. The lodge was cleaned and swept, and the head of the bear lifted up, and a new Stroud blanket, which had never been used, spread under it.

"The pipes were now lighted, and Wawatam blew tobacco-smoke into the nostrils of the bear, telling me to do the same, and thus appease the anger of the bear on account of my having killed her. I endeavored to persuade my benefactor and friendly adviser that she no longer had any life, and assured him that I was under no apprehension from her displeasure; but the first proposition obtained no credit, and the second gave but little satisfaction. At length, the feast being ready, Wawatam made a speech resembling in many respects his address to the manes of his relations and departed companions; but having this peculiarity, that he here deplored the necessity under which men labored thus to destroy their friends. He represented, however, that the misfortune was unavoidable, since without doing so they could by no means subsist. The speech ended, we all ate heartily of the bear's flesh; and even the head itself, after remaining three days on the scaffold, was put into the kettle."



POLAR BEARS ON THE ICE.

There are several kinds of bears in North America, which have been deemed distinct species, but are now regarded as mere varieties. There are the Cinnamon Bear, so named on account of its color; the Yellow Bear of the Carolinas, also deriving its name from the color of its hair; the Barren-ground Bear, of Northern British America; and the *Ours Gulaire*, *Ursus gularis*, of Geoffroy, with a white throat. The habits of these are in no respects different from those of the black bears; they show, however, that the species is subject to great diversity of color, from a deep black to a brownish yellow. Those of the lighter complexion seem to inhabit the more southern portions of the country.

The Spectacled Bear, *U. ornatus*, inhabits the Cordilleras of the Andes in Chili. Its fur is smooth, shining, and black, except that its short muzzle is of a dirty yellow or buff color, and there are two semicircular marks of the same hue, reminding the observer of a pair of spectacles, above the eyes; the under parts of the throat and neck, and the upper part of the breast, are whitish.

The White Bear, Polar Bear, or Ice Bear, *U. Arctos*, or *U. maritimus*, belongs to both continents. It is an inhabitant of the dreary regions which surround the North Pole with eternal frost, and of those coasts which are rarely free from ice; hence it is almost entirely carnivorous in a state of nature. Animals of the land and of the sea, birds and their eggs, the dead and the living, are its food. An admirable swimmer and diver, and of great strength, he often captures the seal, and is said to attack the walrus itself. Cartwright saw a Polar bear dive after a salmon, and with success, for he killed his fish. Captain Lyon gives the following account of its hunting the seal:

"The bear, on seeing his intended prey, gets quietly into the water, and swims until to leeward of him, whence, by frequent short dives, he silently makes his approaches, and so arranges his distance, that at the last dive he comes to the spot where the seal is lying. If the poor animal attempts to escape by rolling into the water, he falls into the bear's clutches; if, on the contrary, he lies still, his destroyer makes a powerful spring, kills him on the ice, and devours him at leisure."

The same author informs us that this bear not only swims with rapidity, but is capable of making long springs in the water. Sabine states that he saw one about midway between the north and south shores of Barrow's Straits, which are forty miles apart, though there was no ice in sight to which he could resort for rest.

The Polar bear seems to be, in a great measure, the scavenger of the Arctic seas. The floating carcasses of whales and other marine animals form a considerable part of his food, and the smell of the burning kreng often brings him to the whale-ships. In the absence of other food, however, he does not disdain to seek the shore in quest of berries and roots. That he can live on vegetable food alone, has been proved in the feeding of specimens in the menageries of both London and Paris. The sea, however, is his great storehouse. Of course, he never attacks the full-grown whale, because the weapons with which he is furnished are not capable of inflicting any vital injury upon it, while a blow from the whale's tail, even on the water, would flatten him like a pancake. He would attack it at a disadvantage, too; for although he can swim for many miles, he is, like other quadrupedal animals, powerful only when he has a firm support. He does, however, often attempt, and sometimes succeeds, in capturing the young of the whale, while they are so small that he can drag them on the ice. But this is a perilous meal for him; as the whales he is able to land on the ice are sucking whales, and the mother is generally very watchful of them. She can either carry the young one away far faster than the bear can follow, or she can fight boldly in its defense; so that it becomes food for the bear only by stratagem. The walrus is much more an ice and rock animal than the whale; but still the walrus is never so far from the water that it cannot easily regain that element: it has perfect command of itself there, and is furnished with tusks so powerful, that although the bear sometimes ventures to measure his strength with it, he seldom gains the mastery. The young of the walrus is, however, often caught by him; but still the seal is his staple food, and it is very abundant. The ice upon the Polar seas is not so smooth as that which forms upon fresh water in lower latitudes, because, when it is first formed, the water is generally in motion, and there is not unfrequently snow, so that there is a scum of trash or icy fragments, before the water consolidates into a continuous field of ice. This gives it a granulated surface, which is afterward powdered over with snow, which falls, not in flakes, but in small particles, when the cold is very great. This surface, when once it is formed, remains undecayed during the sunless months; but when the sun begins to exert its influence, the surface alternately thaws and freezes, at which time it becomes so slippery that it is difficult footing. To the Polar bear, however, it is a safe path, and that animal never slides or stumbles, be the smoothness of the surface what it may. It also moves faster upon firm ground than might be supposed from its appearance. Captain Lyon describes its pace when at full speed, as "a kind of shuffle, as quick as the sharp gallop of a horse."

This species is of a more lengthened form than that of other bears; the head is very much elongated and flattened, the ears and mouth are comparatively small, the neck is very long and thick, and the sole of the foot very large. The fur is silvery white, tinged with yellow, close and



POLAR BEARS IN THE MENAGERIE OF THE ZOOLOGICAL GARDENS, LONDON.

short, even on the head, neck, and upper part of the back; long, fine, and inclined to be woolly on the hinder parts, legs, and belly. The sole of the foot exhibits a beautiful instance of adaptation of means to an end, for it is almost entirely covered with long hair, affording the animal a firm footing on the ice. The claws are black, not much curved, thick, and short.

The accounts given of the size, strength, and ferocity of this animal by the early navigators are appalling; but the accuracy of modern investigation has dissipated a good deal of the awe with which it was regarded, and has gone far to prove that the excited imagination of some of the narrators has led them beyond the truth.

The gallant adventurers who conducted the modern northern expeditions, penetrated far beyond the points formerly reached, and had opportunities of observing numbers of Polar bears. The greatest length from nose to tail, recorded by Captain Phipps, is seven feet one inch, the weight of the beast being six hundred and ten pounds. Sir John Ross records the measurement of seven feet ten inches, and the weight of eleven hundred and sixty pounds; and Captain Lyon states that one which was unusually large, measured eight feet seven and a half inches, and weighed sixteen hundred pounds! The greater number of full-grown individuals are spoken of as far inferior to these in dimensions and weight. Fine specimens of this animal may be seen at the gardens of the Zoological Society in London, and the Garden of Plants, Paris.

Pennant states that Polar bears are frequent on all the Asiatic coasts of the Frozen Ocean, from the mouth of the Obi eastward, and that they abound in Nova Zembla, Cherry Island, Spitzbergen, Greenland, Labrador, and the coasts of Baffin's and Hudson's bays, but that they are unknown on the shores of the White Sea. Sir Edward Parry saw them within Barrow's Straits as far as Melville Island; and, during his daring boat-voyage, beyond 82° N. latitude. Sir John Richardson says that the limit of their incursions southward on the shores of Hudson's

Bay and of Labrador, may be stated at about the fifty-fifth parallel. Sir John Franklin learned from the Esquimaux to the westward of Mackenzie River, that they occasionally, though rarely, visited that coast. Captain Beechey did not meet with any in his voyage to Icy Cape.

As the Polar bear resides principally on the fields of ice, he is frequently drifted far from the land. In this way, they are often carried from the coast of Greenland to Iceland, where they commit such ravages on the flocks that the inhabitants rise in a body to destroy them.

The pairing time of this species is in May, and such is their attachment to each other that if one of them is killed, the other will suffer itself to be destroyed rather than leave it. The males do not hibernate, but the females do. The Esquimaux account of this process is thus reported by Captain Lyon:

"At the commencement of winter, the she-bears are very fat, and always solitary. When a heavy fall of snow sets in, the animal seeks some hollow place in which she can lie down, and then remains quiet while the snow covers her. Sometimes she will wait until a quantity of snow has fallen, and then digs herself a cave: at all events, it seems necessary that she should be covered by and lie among snow. She now goes to sleep, and does not wake until the spring sun is pretty high, when she brings forth her two cubs. The cave, by this time, has become much larger, from the effect of the animal's warmth and breath, so that the cubs have room enough to move, and they acquire considerable strength by continually sucking. The dam at length becomes so thin and weak, that it is with great difficulty she extricates herself when the sun is powerful enough to throw a strong glare through the snow which roofs the den. The Esquimaux affirm, that during this long confinement the bear has no evacuations, and is herself the means of preventing them by stopping all the natural passages with moss, grass, or earth. The natives find and kill the bears during their confinement by means of dogs, which scent them through the snow, and begin scratching and howling very eagerly. As it would be unsafe to make a large opening, a long trench is cut, of sufficient width to enable a man to look down, and see where the bear's head lies; he then selects a mortal part, into which he thrusts his spear. The old one being killed, the hole is broken open, and the young cubs may be taken out by hand, as, having tasted no blood, and never having been at liberty, they are then very harmless and quiet. Females which are not pregnant roam about through the winter in the same manner as the males."

Of the attachment of these northern she-bears to their young, we have many interesting accounts. The following is furnished by Scoresby, in his narrative of a "Voyage to Greenland:"

"Early in the morning, the man at the mast-head gave notice that three bears were making their way very fast over the ice, and directing their course toward the ship. They had probably been invited by the blubber of a sea-horse, which the men had set on fire, and which was burning on the ice at the time of their approach. They proved to be a she-bear and her two cubs; but the cubs were nearly as large as the dam. They ran eagerly to the fire, and drew out from the flames part of the flesh of the sea-horse, which remained unconsumed, and ate it voraciously. The crew from the ship threw great pieces of the flesh, which they had still left, upon the ice, which the old bear carried away singly, laid every piece before her cubs, and dividing them, gave each a share, reserving but a small portion for herself. As she was carrying away the last piece, they leveled their muskets at the cubs, and shot them both dead: and in her retreat, they wounded the dam, but not mortally.

"It would have drawn tears of pity from any but unfeeling minds, to have marked the affectionate concern manifested by this poor beast, in the last moments of her expiring young. Though she was sorely wounded, and could but just crawl to the place where they lay, she carried the lump of flesh she had fetched away, as she had done the others before, tore it in pieces, and laid it down before them; and when she saw that they refused to eat, she laid her paws first upon one, and then upon the other, and endeavored to raise them up. All this while it was piteous to hear her moan. When she found she could not stir them, she went off, and when at some distance, looked back and moaned; and that not availing to entice them away, she returned, and smelling around them, began to lick their wounds. She went off a second time as before; and having crawled a few paces looked again behind her, and for some time stood moaning. But,

still her cubs not rising to follow her, she returned to them again, and with signs of inexpressible fondness went round first one and then the other, pawing them, and moaning. Finding at last that they were cold and lifeless, she raised her head toward the ship, and growled her resentment at the murderers, which they returned with a volley of musket-balls. She fell between her cubs, and died licking their wounds."

Dr. Kane, in his "Arctic Explorations," furnishes us many interesting sketches of the Arctic bear. In one instance, he saw one of these huge beasts sliding down hill on his rump, the hill being a huge declivity of ice. Whether the beast was doing this for fun, or as a short cut in the progress of his journey, does not appear. The following incidents are interesting alike on account of the nature of the story and the manner in which it is told. It will be understood the adventurers had met with one of these formidable animals and her cub:

"The bear fled; but the little one, being unable either to keep ahead of the dogs or to keep pace with her, she turned back, and putting her head under its haunches, threw it some distance ahead. The cub safe for the moment, she would wheel around and face the dogs, so as to give it a chance to run away; but it always stopped, just as it alighted, till she came up and threw it ahead again; it seemed to expect her aid, and would not go on without it. Sometimes the mother would run a few yards ahead, as if to coax the young one up to her; and when the dogs came up, she would turn on them and drive them back; then, as they dodged her blows, she would rejoin the cub and push it on, sometimes putting her head under it, sometimes catching it in her mouth by the nape of the neck.

"For a time, she managed her retreat with great celerity, leaving the two men far in the rear. They had engaged her on the land ice; but she led the dogs in shore, up a small stony valley which opened into the interior. After she had gone a mile and a half, her pace slackened, and the little one being jaded, she soon came to a halt.

"The men were then only half a mile behind; and, running at full speed, they soon came up to where the dogs were holding her at bay. The fight was now a desperate one. The mother never went more than two yards ahead, constantly looking at the cub. When the dogs came near her, she would sit upon her haunches, and take the little one between her hind-legs, fighting the dogs with her paws, and roaring so that she could have been heard a mile off. 'Never,' said Morton, 'was an animal more distressed.' She would stretch her neck, and sweep at the nearest dog with her shining teeth, whirling her paws like the arms of a windmill. If she missed her aim, not daring to pursue one dog lest the others should harm the cub, she would give a great roar of baffled rage, and go on pawing and snapping and facing the ring, grinning at them with her mouth stretched wide open.

"When the men came up, the little one was perhaps rested, for it was able to turn around with its dam, no matter how quick she moved, so as to keep always in front of her belly. The five dogs were all the time frisking about her, actively tormenting her, like so many gad-flies; indeed, they made it difficult to draw a bead on her without killing them. But Hans, lying on his elbow, took a quiet aim, and shot her through the head. She dropped instantly, and rolled over dead, without moving a muscle.

"The dogs sprang toward her at once; but the cub jumped upon her body, and reared up, for the first time growling hoarsely. They seemed quite afraid of the little creature, she fought so actively and made so much noise; and while tearing mouthfuls of hair from the dead mother, they would spring aside the moment the cub turned toward them. The men drove the dogs off for a time, but were obliged to shoot the cub at last, as she would not quit the body."

We cannot forbear one more extract from the adventures of this daring explorer:

"The journey began again as the feast closed, and we should have accomplished my wishes had it not been for the untoward influence of sundry bears. The tracks of these animals were becoming more and more numerous as we rounded one iceberg after another; and we could see the beds they had worn in the snow while watching for seal. These swayed the dogs from their course: yet we kept edging onward, and when in sight of the northern coast, about thirty miles from the central peak of the 'Three Brothers,' I saw a deep band of stratus lying over the horizon in the direction of Kennedy Channel. This water-sky indicated the continued opening

of the channel, and made me more deeply anxious to proceed. But at this moment our dogs encountered a large male bear in the act of devouring a seal. The impulse was irresistible: I lost all control over both dogs and drivers. They seemed dead to every thing but the passion of pursuit. Off they sped with incredible swiftness; the Esquimaux clinging to their sledges and cheering their dogs with loud cries of 'Nannook!' A mad, wild chase, wilder than German legend,—the dogs, wolves; the drivers, devils. After a furious run, the animal was brought to bay; the lance and the rifle did their work, and we halted for a general feed. The dogs gorged themselves, the drivers did as much, and we buried the remainder of the carcass in the snow. A second bear had been tracked by the party to a large iceberg north of Cape Russell, for we had now traveled to the neighborhood of the Great Glacier. But the dogs were too much distended by their abundant diet to move: their drivers were scarcely better. Rest was indispensable."

FOSSIL BEARS.

We have already alluded to the fact, that the bones of various extinct Carnivora, and among them those of bears, are found abundantly in the caves of Italy, Germany, France, and England. In a single cavern, that of Külock, in England, Dr. Buckland estimated that there must be the relics of at least twenty-five hundred bears. The history of these fossils well illustrates the wanderings of the human mind, when exercised upon matters of which it is ignorant. Two or three centuries ago only—that is, before any just ideas of Geology were entertained—these bones were considered as those of unicorns and dragons, and figured largely in the medical prescriptions of the time. The caverns in the neighborhood of the Hartz Mountains, abounding in relics of this kind, were ransacked, and quantities of "unicorn bones" were taken away and sold, as possessing marvelous healing virtues. So late as 1672, a German savan gave representations of some bones taken from a cave in the Carpathians, as those of dragons, and by way of helping out the story, he stated that dragons, living and flying about, were to be met with in Transylvania! To doubt these marvels in those days was reprobate infidelity.



THE SLOTH BEAR.



THE BLACK BINTURONG.—(See p. 177.)

THE VIVERRIDES.

This family includes a great number of animals, all much smaller than the bears, and having a resemblance to the Civet, or *Viverra*, in form and habits. They are divided into several tribes, as the *Subursins*, *Viverrins*, and *Mangoustes*.

THE SUBURSINS.

This tribe derives its name—which means an inferior sort of bear—from the resemblance of the raccoon, and some other of its species, to the bear.



THE KINKAJOU.

Genus KINKAJOU: *Cercoleptes.*—Of this genus there is a single species, the MANAVIRI or KINKAJOU, or KINKAJOU POTTO, *C. caudivolvulus*, a graceful animal, somewhat smaller than a cat,

found in Guiana, Brazil, and Peru, which has the local name of *Cuchumoi*. Its body is long, the legs short, the feet plantigrade, the tail prehensile, the fur thick, woolly, and of a grayish or russet brown. It is gentle in disposition, and does not lack intelligence. The ancient inhabitants of New Granada reduced it to a state of domesticity. It lives in the deep forests, and, rolled into a ball, sleeps profoundly during the day. As night advances, it opens its eyes, and by degrees awakes to activity, and then goes forth in quest of its food, which consists of small quadrupeds and birds, insects and fruits. It climbs trees, and runs along the branches in search of birds' nests: it is also a skillful bee-hunter, and, taking advantage of the dormant state of the insects during the night, it breaks the honey-comb with one of its paws, and licks up the precious treasure with its long tongue. This habit led the early missionaries to call it the *Honey-Bear*. In the menageries of Europe it has been found an exceedingly docile and gentle creature, feeding readily on fruit, cakes, biscuit, honey, or milk. When angry, its voice resembles the barking of a small dog.



THE WAH, OR PANDA.

Genus PANDA: *Ailurus*.—Of this there is but the WHA, WAH, or PANDA, *A. fulgens*, distinguished by the elegance of its fur, which is very thick and of a lively russet, passing into brown along the limbs. The tail is very thick at the base, and is marked with rings of black. The animal is somewhat smaller than a cat; its haunts are about rivers and mountain-torrents, where it lives much on trees, and feeds on birds and the smaller quadrupeds. It frequently utters a loud cry of "*Wha! wha!*" whence one of its names. This sound also betrays it to the hunters. It is found in the hills of the Himalayah chain, between Nepaul and the Snowy Mountains. It is called *Chitwa* by the natives.

Genus RACCOON: *Procyon*.—Of this genus there are two species, the COMMON RACCOON, *P. lotor*, of the United States, and the CRAB-EATING RACCOON, *P. cancrivorus*, of tropical America. The former is spread over North America from Hudson's Bay to Louisiana, excepting only in the more thickly settled regions, where it has been exterminated. In many parts, it is a common object of pursuit with the sportsman; in the Southwestern States, it is so abundant as to be a nuisance. All—even those who never see it in its native haunts—are familiar with it in menageries, in the legends of hunters, and in the sleigh-robes garnished with its skins. Many a song of the *Coon* delights the village dilettanti; and who has not heard the story of Captain John Scott, the forester whose rifle never missed, and the Coon—which runs to this effect:

"*Coon on the tree, loquitur*.—Who are you, stranger?

"*Hunter*.—My name is Scott.

"*Coon*.—Captain Scott?

"*Hunter*.—Yes.

"*Coon.*—Captain *John* Scott?

"*Hunter.*—The same.

"*Coon.*—Well, well, don't fire; its no use. I'll come down directly."

The raccoon is about twenty-six inches long; the tail eight inches; the weight twenty to twenty-five pounds. The head is rather round, the nose sharp and flexible, and the expression of the face cunning, sly, and foxy. The feet are plantigrade, and hence the animal was considered by some early naturalists as a small bear. The general color of the fur is blackish gray, but paler on the under part of the body; the point of the nose and soles of the feet black, and the eyes black. Around the face is a circle of yellowish-white hair. The tail is marked with five or six black rings, and is tipped with black. The body is stout, the back arched upward, the legs rather long, and the claws strong.

The favorite haunts of the raccoon are solitary forests upon marshy grounds, intersected by streams. His food consists of birds' eggs, the eggs of the soft-shelled turtle, frogs, mussels, and various other small animals. Along the coast in the Southern States, he finds a species of oyster



THE RACCOON.

in which he delights: though we are told that he sometimes pays dear for the whistle, as he gets his paw caught by a fixed shell, and, unable to escape, he is drowned by the returning tide. Sometimes he creeps silently in the sedges like a cat, snapping up a duck that comes within his reach. He climbs trees with ease, and not unfrequently robs the nests of the woodpecker, by putting his long paws into the holes which this bird has chiseled in the limb of a dry tree. When the corn is in the milk, he steals at night into the fields and feasts himself to satiety, reckless of the damage done to the crop, and the ire of the planter when he discovers the theft. His conical head and sharp, flexible nose are not made in vain, for these enable him to pry into corners and crevices for spiders, worms, and the larvæ of various insects, of which he is very fond.

Thus the raccoon is an animal of large resources and marked character. He goes prowling about as well by night as by day. He is a fisher, a hunter, a trapper, a reaper, or a fly-catcher, as occasion may require. He is instinctively cunning as the fox, inquisitive and meddlesome as the monkey, greedy as a bear, sly as a cat. In northern climates, on the approach of winter, he retires to his home and sleeps like the bear till spring, or only goes abroad occasionally in fair weather. At the South, he is active during the year. His nest is usually made in the hollow trunk of a tree. From four to six young ones are produced at a birth, this event taking place in May. The young coons are half as big as a rat, and utter a plaintive wail like an infant.

The raccoon is easily tamed, and becomes an amusing though troublesome pet. He uses his fore-feet like hands, and is an expert pickpocket. He will follow his master even along the streets of a town. He is, however, perpetually peering about, and his inquisitiveness becomes, after a time, quite tedious and vexatious. His greediness for sugar, honey, and other sweet things, renders him importunate and troublesome.

The hunting of the raccoon is a favorite sport in some parts of the country. The hunts usually take place by moonlight, dogs being used to tree the game. Great experience is required, as these creatures are nimble and subtle, and often baffle even the most skillful hunters. Many of these animals are caught in various kinds of traps.



THE CRAB-EATING RACCOON.

The *Crab-eating Raccoon* resembles the preceding, though the body is rather longer and more slender. The general color is an ashy brown; the breast and belly of a lighter shade. It climbs trees with agility, and feeds on acorns, grapes, berries, eggs, birds, &c. It sometimes seizes the chickens around a plantation: it follows the water-courses, and devours frogs and fish; it also delights in sugar-cane. It seems to be chiefly nocturnal in its habits. It is most abundant in the northern parts of South America, but is found also in Mexico, Texas, and California.



THE COATI MONDI.

Genus COATI: *Nasua.*—Of this genus there are said to be several species. They are distinguished by a long body, a long head terminating in a long flexible snout, with which they root in



THE ICTIDES ALBIFRONS.—(See p. 177.)

the ground. They are nearly of the size of a cat; the color is fawn, mixed with gray and black, becoming paler on the under parts. The tail is half the length of the body, and is slightly annulated. Like certain monkeys, they often gnaw off their tails,—whether because they ache or itch, or are too long for convenience, or whether as a matter of taste, is not known. They are semi-plantigrade, but they have strong, sharp claws, and are expert climbers. Their voice, when pleased, is a soft grumble; when angry, they utter a sharp, strong cry. Their food consists of insects, worms, snails, fruits, honey, eggs, birds, and other small animals. They are not ferocious, and easily become tamed; they are, however, restless in captivity, but possess a kind of gentle curiosity, which excites interest. In the menagerie at Paris, there are several of them, which are kept with the monkeys, to which, in common with the raccoon, they have a certain analogy.

The Coati Mondi, or the Brown Coati, *Nasua narica*, is the only one of the species that appears to be well established. The word *mondi* means solitary, and is used to distinguish this species from another, the *Social Coati*. Tschudi makes out five species: the *Social Coati*, the *Solitary Coati*, the *Coati leucorhyncha*, the *Banded Coati*, and the *Mountain Coati*. But Gervais, after a careful examination, reduces them to one—that which we have named above—the distinctions of size, color, &c., showing only varieties and not specific differences. This conclusion seems to be justified by the fact that, with abundant opportunities, only one species, the *Coati Mondi*, has come under familiar observation at the menageries. This animal is found from Mexico to Brazil.

Genus BINTURONG: *Ictides.*—Of this genus, called *Arctictis* by Temminck, there appears to be only one species, the BLACK ICTIDE, *I. ater*, the *Viverra binturong* of Raffles. Its color is black, speckled with gray. The hair is long, and there is a tuft at each ear. The tail is long and hairy, and has a propensity to curl, as if prehensile, which it is in fact, to some extent. The *I. albifrons*, which is of a grayish-brown color, is only the female of the *I. ater*, and not a distinct species, as some naturalists have supposed.

THE VIVERRINS.

This family includes a number of genera, all bearing considerable resemblance to the Genet, and, with a single exception, that of the *Bassaris*, belonging to the Eastern continent. They are nocturnal in their habits, and the eyes contract into a perpendicular line, like those of the cat, when exposed to the light. They are generally, although not in all the species, savage and blood-thirsty, making great havoc among birds and small animals, such as rats, mice, squirrels, frogs, and the like. Several of the species possess an anal pouch, which yields a strong, musky secretion.

Genus CYNOGALE: *Cynogale.*—Of this there is but a single species, the *Cynogale Bennetti*, found in Borneo. Its body is about eighteen inches long, and of a slender form; the legs are short; the fur thick and soft, resembling that of the otter. The color is brown, tinged with gray. It frequents moist places, and enters lakes and rivers in search of its prey, which consists of fish and other animals.



THE CIVET.

Genus CIVET: *Viverra.*—Of this there are two species, the most common of which is the CIVET, *V. civetta.* The length of the elongated body of this animal is from two to three feet; the tail about half as long as the body; height from ten inches to a foot; hair of the body long, brownish gray, with numerous interrupted, transverse, black bands or spots of the same color. The hairs on the ridge or middle line of the back, from between the shoulders, are longer, and can be raised or depressed at the pleasure of the animal. The legs and most part of the tail are black; upper lip and sides of the neck, almost white. The eyes are surrounded each by a black patch. Two or three black bands pass from the base of the ears obliquely toward the shoulder and neck, which last has a broad black patch. It is a native of the north of Africa.

The CIVET approaches in its habits nearest to the foxes and smaller cats, preferring to make its predatory excursions against birds and smaller quadrupeds in the night, although, like these carnivora, it will occasionally attack its prey in the day-time.



THE SURICATE.—(See p. 183.) THE CYNOGALE.

In a state of captivity it becomes in a degree tame, but never familiar, and is dangerous to handle. The young are fed on farinaceous food, millet-pap for instance, with a little flesh or fish; and, when old, on raw flesh. Many of them are kept in North Africa to obtain the perfume which bears the name of the animal, and brings a high price. The *civet* is procured by scraping the inside of the pouch with an iron spatula at intervals—about twice a week. If the animal is in good condition and a male, especially if he has been irritated, a dram or thereabouts is obtained each time. The quantity collected from the female does not equal that secreted by the male. Civet, which, by the way, is sometimes confounded with musk, like most other articles of this nature, is much adulterated, and it is difficult to get it quite pure. The adulteration is effected with suet or oil to make it heavier.

The other species, the ZIBET, *V. zibetha*, is somewhat smaller than the preceding; the general complexion is brownish gray, marked with small, black, round spots. It is a native of India. A species of zibet is also found in the islands of Sumatra, Borneo, and Celebes, somewhat larger than the one just described. The fur is also of a lighter color. To this is given the name of *V. Tangalunga* by naturalists.

Genus GENET: *Genetta.*—Of this genus there are several species, all somewhat smaller than a cat, and all living upon animal prey.

The COMMON GENET, *G. vulgaris*—*Viverra genetta* of Linnæus—is of a beautiful reddish gray, spotted with small black or brown patches, which are sometimes round and sometimes oblong; the tail, which is as long as the body, is ringed with black and white, the black rings being to the number of nine or eleven. There are white spots on the eyebrow, the cheek, and on each side of the end of the nose. It appears, however, that there is some variety in the size and number of the patches, the bands along the shoulder and neck, the lines on the nape, etc.

This handsome animal is found both in a wild and domestic state in the south of Europe, and thence southward through Africa to the Cape of Good Hope. In its natural state, it loves to dwell in low lands, or along the banks of rivers and lakes, and in the vicinity of springs. It is of predatory habits, and feeds upon small animals, although it also eats vegetables. In the light, the eyes contract like those of a cat, and the claws are nearly as retractile as those of that



THE GENET.

animal. Its disposition is meek and gentle, except when irritated; in many places it is kept instead of a cat, to destroy vermin. In Constantinople it goes from house to house, clearing them of rats and mice. It has a pouch beneath the tail, which emits a faint smell of musk. The popular opinion is, that the rats and mice are so disgusted with this scent that they immediately abandon a house when a genet comes into it. It is not strange that an animal which delights in eating and killing these pests, should be in bad odor with them. The fur of the genet is fine, thick, and soft; and, on account of its beautiful markings, is greatly prized.

The Rasse, *G. Indica*, resembles the zibets, and has been classed with them by some writers. Dr. Horsfield says:

"It supplies in Java the place which the civet holds in Africa, and the zibet on the Asiatic continent and in the large islands of the Indian Archipelago. I have endeavored to show that, by its form and marks, it is essentially distinct from the *V. zibetha;* and it differs as much in its natural disposition as in external characters. The zibet is an animal comparatively of a mild disposition; it is often found among the Arabs and Malays who inhabit the maritime parts of Borneo, Macassar, and other islands, in a state of partial domestication; and, by the account of the natives, becomes reconciled to its confinement, and in habits and degree of tameness resembles the common domestic cat. The rasse, on the contrary, preserves in confinement the natural ferocity of its disposition, undiminished. As the perfume which it yields is greatly valued by the natives, it is frequently kept in cages; but, as far as I have observed, it must always be obtained for this purpose from a wild state, as it does not propagate in confinement.

"The rasse is not unfrequently found in Java, in forests of a moderate elevation above the level of the ocean. Here it preys on small birds and animals of every description. It possesses the sanguinary appetite of animals of this family, in a high degree, and the structure of its teeth corresponds strictly with its habits and modes of life. In confinement, it will devour a mixed diet, and is fed on eggs, fish, flesh, and rice. Salt is reported by the natives to be a poison to it. The odoriferous substance is collected periodically: the animal is placed in a narrow cage, in which the head and anterior extremities are confined; the posterior parts are then easily secured, while the civet is removed by a simple spatula."

The substance obtained from the rasse agrees with the civet afforded by the civet and zibet in color, consistence, and odor. It is a very favorite perfume among the Javanese, and is applied both to their dresses and, by means of various unguents and mixtures of flowers, to their persons. Even the apartments and the furniture of the natives of rank are generally scented with it to such a degree as to be offensive to Europeans; and at their feasts and public processions the air is widely filled with this odor.

The Fossan, *Viverra Fossa* of Linnæus, is of a fawn-color, marked with irregular brown spots. The tail is faintly annulated with black; the body is long and slender, and the legs are longer and the tail shorter than those of the other genets. When irritated, it emits a strong, musky

odor. It eats both flesh and fruit, and is very fond of bananas. It is wild, and difficult to be tamed. Its eye is large and black, giving the animal a mischievous look. It is a native of Madagascar.

The other species of Genet are as follows: the Senegal Genet, *G. Senegalensis;* the Abyssinian Genet, *G. Abyssinica;* the Genet of Fernando Po, *G. Poensis;* the Tigrine Genet, *G. tigrina;* and the Pardine Genet, *G. pardina*, of Senegambia. None of these are distinguished by striking peculiarities.

Genus LINSANG, or PRIONODON: *Linsang.*—Of this there are two species, both resembling the genets, but somewhat insectivorous in their habits. The Slender Linsang, *L. gracilis*, is of a light fawn, variegated with brown spots. The tail is marked with eight rings. It is a native of Malacca. The Parti-colored Lisang, *L. pardicolor*—the *Prionodon pardicolor* of Hodgson—resembles the preceding, though differently marked in its colorings. It is a native of Nepaul.



THE PARADOXURUS.

Genus PARADOXURE: *Paradoxurus.*—The name of this genus, given by F. Cuvier, was intended to indicate a peculiarity of the tail, which he noticed in a living specimen, and which consisted in carrying this member constantly on one side, rolled into a coil. Nevertheless, these animals seem to have nearly as much command of their tails as the sajous. It is less prehensile, but they coil it around their bodies with the same facility. Their nails are hooked and semi-retractile, and they have an odorous pouch like the genets and civets, though the smell is far less intense. They are found in India and the Asiatic isles, and are nearly omnivorous in their habits.

The Pougonie, *P. typus*, is of a yellowish brown, marked with three ranges of obscure spots on the back; the sides and legs are also marked with spots, irregularly disposed; the muzzle is gray, the tail and feet black. The body is eighteen inches long. This animal is an agile climber of trees, where it pursues small quadrupeds and birds; it also feeds on eggs and fruits. It is mild in its disposition, and is found in India, where the French call it the *Palm-Martin.*



THE POUGONIE.

The Masqued Paradoxure, *P. larvatus*, is of a dirty fawn-color, and is found in the region of the Himalayah Mountains. The *P. musanga*, called the *Banded Wild-Cat* by Sonnerat, and the *Striped Pole-Cat* by Buffon, is common in the islands of Java, Borneo, &c. The *Prehensile Paradoxure* of some authors is only a variety of this.



THE EUPLERE.

The other species are as follows: *P. leucopus*, *P. Bondar*, *P. Philippensis*, *P. setosus*, *P. stigmaticus*, *P. aureus*, *P. leucomystax*, *P. trivirgatus*, *P. Grayi*, and *P. O'Gilbyi*. A portion of these are arranged under the generic name of *Paguma*, by Gray.

Genus HEMIGALUS: *Hemigalus*.—The animals of this genus are not very distinct from the preceding, except in their dentition, which indicates more insectivorous propensities.

The Zebra Hemigale, *H. zebra*, the only species, is like the linsangs in its size and general colorings. Its complexion on the head and sides of the neck is fawn, barred with brown; the rest of the form is blackish brown. The length of the body is fifteen inches. It is found only in Borneo.

Genus EUPLERES: *Eupleres.*—The single species of this genus, *E. Goudotii*, is of a slender form, about a foot in length, low on its legs, digitigrade, with a tail half the length of the body. Its color is a brownish fawn; its fur thick and woolly. Its teeth indicate an insectivorous tendency. It is found in Madagascar.

Genus NANDINIA: *Nandinia.*—The only known species, *N. binotata*, is a beautiful animal of the size of the genet, with soft fur, of a brown complexion, and spotted with black. It is a good climber, and has claws partially retractile. Its habitat is the island of Fernando Po, and the adjacent territories of Guinea.



THE CRYPTOPROCTA FEROX.

Genus CRYPTOPROCTA: *Cryptoprocta.*—The only species, *C. ferox*, is but fifteen inches long, but its strength is great. Its disposition is ferocious and sanguinary in the highest degree. The body is slender and the back arched; the color russet, the head round, and the claws retractile. In these respects, this animal greatly resembles the cat family, but it has odoriferous glands, which class it with the genets.

Genus BASSARIS: *Bassaris.*—We now come to the only American animal in the long list of the Viverrides—the Ring-tailed Bassaris, *B. astuta*. It has a sharp, pointed nose, and a cunning expression, reminding one of a fox or raccoon. Its resemblance to the latter animal has given it the name of *Ring-tailed Raccoon* with the Texans. The body is eighteen inches long, and the tail one foot two. The general color is blackish gray above, and yellowish brown on the lower parts of the sides, there being a sort of brindled appearance over the head and along the back. The tail is distinctly branded with black and white.

In disposition, this animal is lively and playful, running along on the branches of the trees with the agility of a squirrel. It is shy and retiring, and speedily flies to its retreat, which is a hole in a tree, upon the slightest alarm. Its food consists of birds, insects, and small quadrupeds; it is said also to feed on the pecan and other nuts, though this is doubtful. Sometimes it scolds or barks at an intruder, holding its tail curled over its back. It is easily tamed, and among the Mexicans it is domesticated, when it becomes a playful pet, and catches rats and mice. It



THE RING-TAILED BASSARIS.

produces three or four at a birth. It is rather a rare animal in Texas, but is more abundant in parts of Mexico. The natives of that country call it *Caco-mixtle.*

THE MANGOUSTES.

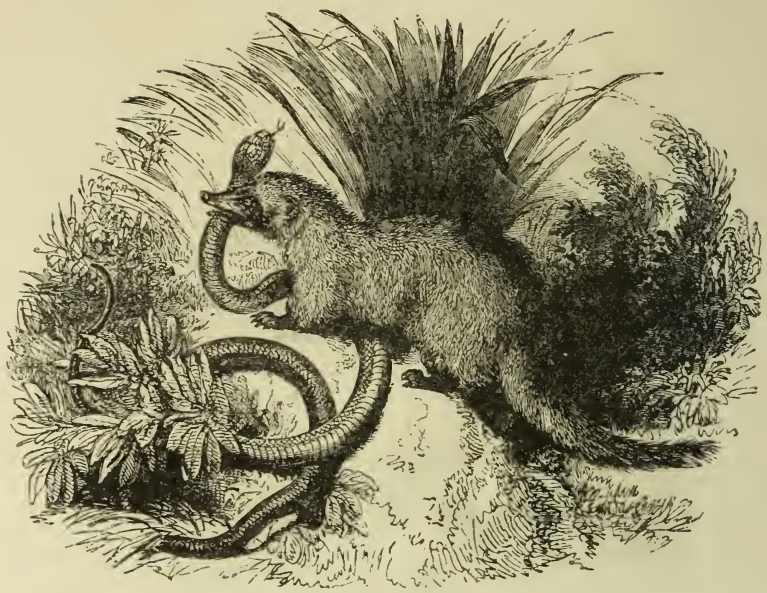
The type of this family, whose name of *Mangouste* is equivalent to *Ichneumon*, or *Herpestes*, is the famous *Ichneumon of Egypt*, sometimes called *Pharaoh's Rat.* The body of all the species is long and slender; they are lively in their motions, and so low on the legs as almost to scrape the ground. The fur is silky and mottled; the nails, generally five on each foot, are sharp and non-retractile. They feed on small animals, insects, and eggs, the latter constituting a large part of their food.

We pass over the genera SURICATE, BDEOGALE, and CYNICTIS, all belonging to Africa, but which present no species of particular interest.

The *Genus* MANGOUSTE, *Mangusta*, or *Herpestes*, presents several interesting species, the first of which is the ICHNEUMON, *M. ichneumon* or *H. ichneumon.* This animal bears a close resemblance to the weasel tribe, both in form and habits. From the tip of the nose to the root of the tail, it is about eighteen inches in length. At the base, the tail is very thick, tapering gradually toward the point, which is slightly tufted. It has a long, active body, short legs, lively and piercing eyes, and a pointed nose; the hair is rough and bristly, of a pale reddish gray. In a wild state, the ichneumon usually resides on the banks of rivers, and swims and dives like the otter, being able to keep under water for a great length of time.

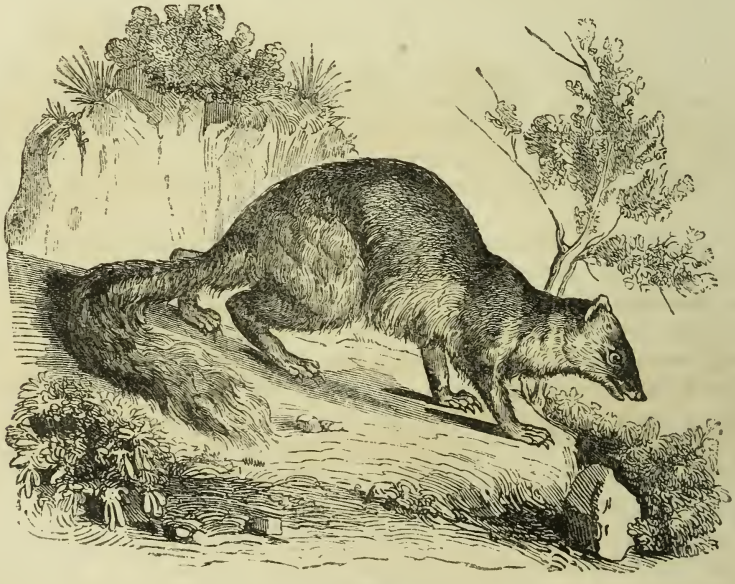
The ichneumon is celebrated in the mythology of ancient Egypt, where it has long been domesticated, and where it was ranked among its divinities, on account of its great utility in destroying serpents, snakes, rats, mice, and other vermin; it is also fond of crocodiles' eggs, which it digs out of the sand where they have been deposited. It is a very fierce, though small animal, and will fight with dogs, foxes, and even jackals, with great fury. It will not breed in confinement, but may be easily tamed when taken young.

The following particulars are related by M. D'Orbsonville, in his "Essays on the Nature of various Foreign Animals:" "I had an ichneumon very young, which I brought up. I fed it at



THE EGYPTIAN ICHNEUMON.

first with milk, and afterward with baked meat mixed with rice. It soon became even tamer than a cat, for it came when called, and followed me, although at liberty, in the country. One day I brought this animal a small water-serpent alive, being desirous to know how far his instinct would carry him against a being with which he was as yet totally unacquainted. His first emotion seemed to be astonishment mixed with anger, for his hair became erect; but in an



THE CYNICTIS.

instant he slipped behind the reptile, and with remarkable swiftness and agility leaped upon its head, seized it, and crushed it between his teeth. This essay, and the new food, seemed to have awakened in him an innate and destructive voracity, which till then had given way to the gentleness he had acquired from education. I had about my house several curious kinds of fowls,

among which he had been brought up, and which, till then, he had suffered to go and come, unmolested and unregarded; but a few days after, when he found himself alone, he strangled them every one, ate a little, and, as it appeared, drank the blood of two."

Sonnini, after stating that the ichneumon is rather tolerated than encouraged about the houses of the Egyptians, says: "Having some resemblance in their habits to weasels and polecats, they feed upon rats, birds, and reptiles. They ramble about the habitations of men; they even steal into them, in order to surprise the poultry and devour their eggs. It is this natural fondness for eggs which prompts them frequently to scratch up the sand with the intention of discovering those which the crocodiles deposit there, and it is in this manner that they prevent, in reality, the excessive propagation of these detestable animals. But it is absolutely impossible to abstain from laughing, and not without reason, when we read of their leaping into the extended mouth of the crocodiles, of their sliding down into their belly, and not returning till they have eaten through their entrails. If some mangoustes have been seen springing with fury on little crocodiles presented to them, it was the effect of their appetite for every species of reptile, and not at all that of a particular hatred, or of a law of nature, in virtue of which they would have been specially commissioned to check the multiplication of those amphibious animals, as many people have imagined."

The mode in which the ichneumon seizes a serpent is thus accurately described by Lucan, in his "Pharsalia:"

"Thus oft the ichneumon, on the banks of Nile,
Invades the deadly aspic by a wile:
While artfully his slender tail is play'd,
The serpent darts upon the dancing shade—
Then, turning on the foe with swift surprise,
Full on the throat the nimble traitor flies,
And in his grasp the panting serpent dies."



THE MOONGUS.

The other species of this genus are as follows:

Widdrington's Ichneumon, *M. Widdringtonii*, the only European species, and found in the south of Spain; the Cape Ichneumon, *M. Caffer*, of South Africa; *M. Mutgigella*, of Abyssinnia; Dr. Smith's Ichneumon, *M. Smithii*, of the Cape of Good Hope; the Brown-tipped Ichneumon, *M. apiculata*, of the same region; the Garangan, *M. Javanica*, of Java; the Mangouste Nems, or Moongus, *M. grisea*, of India and Nepaul; the Nyula, *M. nyula*, of the same countries; the Brown Ichneumon, *M. paludosa*, of the Cape of Good Hope; the Malacca Ichneu-



THE CAPE ICHNEUMON.

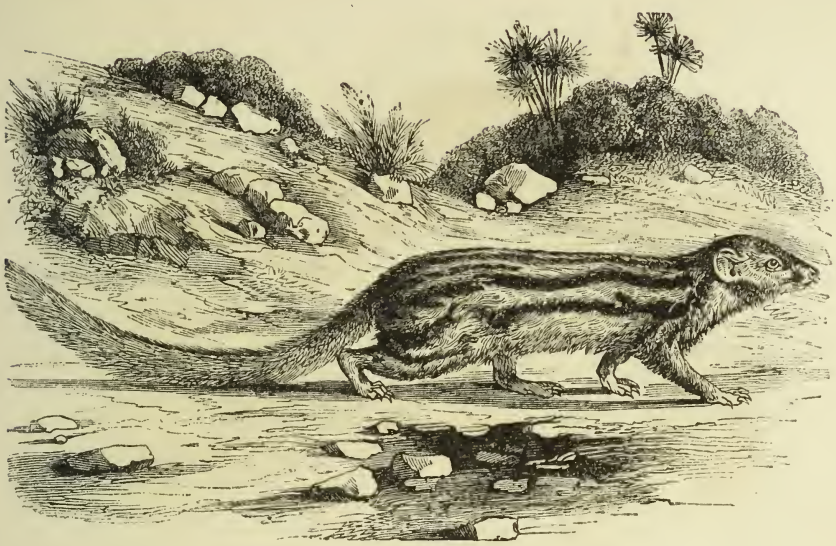
mon, *M. brachyura*, of Malacca; and the Spotted Ichneumon, *M. punctulata*, of South Africa and Natal. It is probable that there are other species, but they are not ascertained.

Genus ATHYLAX, *Athylax*, presents a single species, *Athylax galera*, of Madagascar, distinguished from the mangoustes in having thicker and more woolly fur, this being of a brown color, spotted with whitish gray. The length of the body is eleven inches.



THE GALIDIA ELEGANS.

Genus GALIDIA: *Galidia.*—The species of this genus, all of Madagascar, are not greatly distinguished from the preceding. The *Galidia elegans* is of a lively russet, spotted with brown and olive, the tail being annulated with black. It is ten inches long. The *G. concolor* and *G. olivacea* are the other species.



THE STRIPED GALIDICTIS.

Genus GALIDICTIS, *Galidictis*, presents two species, also of Madagascar. The *G. striata* is distinguished by its coloring, which consists of brown bands or stripes on a light yellowish ground. The body is ten inches long, and the tail long and bushy. The *G. vittata* is described by Dr. Thomson, who possessed one for six months, as diurnal in its habits and agile and graceful in its movements. In the native country of these creatures, they live in the woods, and devour nuts, insects, etc.; they often approach the houses, and make great havoc in the poultry-yards. Like the weasel tribe, they kill their victims, and gorge themselves by drinking their blood.

THE CANIDÆ.

The family of *Canidæ*, from *canis*, a dog, embraces four genera: the *Cynhyene*, including the Hyena-Dog; the *Canis*, including the Dog, Wolf, and Jackal; the *Vulpes*, including the Fox and Fennec; and the *Otocyon*. Formerly the Hyena was included in the same group, but for good reasons, naturalists now give it a separate place. In this family, all the species of which are digitigrade and highly carnivorous, the head is more or less conical and pointed in front, from the jaws being somewhat produced; the legs are of equal length, the anterior being furnished with five, and the posterior with four toes, all armed with non-retractile claws. The tail is of moderate length, and more or less tufted with hair. The senses are acute, that of scent being developed in great perfection. The dentition is complicated: there are three false molars on each side in the upper, and four in the lower jaw; these gradually increase in size posteriorly, and approach the true molar in form. The latter is very large, compressed, and cutting, and is followed in both jaws by two small tubercular teeth; the total number of molars is six above and six below, although this is variable in the dogs. The tongue is soft, and destitute of horny spines.

Genus CYNHYENE: the *Cynhycena* of Cuvier.—Of this genus there is a single species, the *Cynhycena pinctus*, which is found from Caffraria to Abyssinnia. It is nearly of the size of the wolf, but of inferior weight and strength. Its dentition is that of the dog, but it is distinguished by having only four toes on each foot. The jaws are large and the legs long; the colors are brown, yellow, and white, circularly disposed in patches, so as to have a very mottled appearance—these markings varying in different individuals. This animal was at first supposed to be a hyena, and was consequently called the *Painted Hyena:* its common appellation is the Hyena-Dog, it having a closer semblance to the canine species than to any other. It hunts the antelope and



THE HYENA-DOG.

other quadrupeds in large packs, which are led by a chief. These are daring and ferocious, and will sometimes attack mankind.

Genus DOG, *Canis*, or *Canis familiaris.*—In many respects, this is the most remarkable brute in the whole circle of animated nature. Endowed with speed, endurance, sagacity, acute senses and instincts often surpassing reason, he at the same time seeks the society of man, and with affecting docility and attachment, places at his disposal all those high faculties which nature has bestowed upon him. He follows man to every quarter of the globe; he lives in his house; feeds from his master's table, or even from his hand; enters into his feelings, studies his countenance, and joys or sorrows with him in active sympathy. He romps with him in the yard, strolls with him over the fields, hunts for him, fights for him, and, if need be, dies for him. So intimate is this alliance that the dog becomes impressed with his master's character, and at last reflects his manners: you can generally judge of the lord of the manor by the reception which his dog gives you at the gate. The dog partakes of man's social condition: in civilized society, he is civilized; among savages, he also is a savage. So striking are these effects of domestication, that Landseer, the celebrated painter of animals, has happily and humorously represented almost every class of society by groups of dogs. The character of this animal is so beautifully drawn by Buffon, that we cannot do better than give the substance of it:

"The dog, independently of the beauty of his form, his vivacity, force, and swiftness, is possessed of all those internal qualifications that can conciliate the affections of man, and make the tyrant a protector. A natural share of courage, an angry and ferocious disposition, renders the dog in its savage state a formidable enemy to all other animals: but these readily give way to very different qualities in the domestic dog, whose only ambition seems the desire to please: he is seen to come crouching along, to lay his force, his courage, and all his useful talents at the feet of his master; he waits his orders, to which he pays implicit obedience; he consults his looks, and a single glance is sufficient to put him in motion; he is more faithful even than the most boasted among men; he is constant in his affections, friendly without interest, and grateful for the slightest favors: much more mindful of benefits received than injuries offered, he is not driven off by unkindness; he still continues humble, submissive, and imploring, his only hope to be serviceable, his only terror to displease. He licks the hand that has been just lifted to strike him, and at last disarms resentment by submissive perseverance.

"More docile than man, more obedient than any other animal, he is not only instructed in a short time, but he also conforms to the dispositions and the manners of those who command him. He takes his tone from the house he inhabits; like the rest of the domestics, he is



CIVILIZED DOGS, AFTER THE MANNER OF LANDSEER.—(See opposite page.)

disdainful among the great, and churlish among clowns. Always assiduous in serving his master, and only a friend to his friends, he is indifferent to all the rest, and declares himself openly against such as seem dependent like himself. He knows a beggar by his clothes, by his voice, or his gestures, and forbids his approach. When at night the guard of the house is committed to his care, he seems proud of the charge; he continues a watchful sentinel, he goes his rounds, scents strangers at a distance, and gives them warning of his being on duty. If they attempt to break in upon his territories, he becomes more fierce, flies at them, threatens, fights, and either conquers alone, or alarms those who have most interest in coming to his assistance; however, when he has conquered, he quietly reposes upon the spoil, and abstains from what he has deterred others from abusing; thus giving us lessons of courage, temperance, and fidelity."

The importance of this animal to man is well indicated by Burchell in his Travels in Africa: "Our pack of dogs," he says, "consisted of about five-and-twenty of various sorts and sizes. This variety, though not altogether intentional, as I was obliged to take any that could be procured, was of the greatest service in such an expedition, as I observed that some gave notice of danger in one way, and others in another. Some were more disposed to watch against men, and others against wild beasts; some discovered an enemy by their quickness of hearing, others by that of scent; some had speed in pursuing game; some were useful only for their vigilance; and others for their courage in holding ferocious animals at bay. So large a pack was not indeed maintained without adding greatly to our care and trouble in supplying them with

meat and water, for it was sometimes difficult to procure for them enough of the latter; but their services were invaluable, often contributing to our safety, and always to our ease, by their constant vigilance, as we felt a confidence that no danger could approach us at night without being announced by their barking.

"No circumstances could render the value and fidelity of these animals so conspicuous and sensible as a journey through regions which, abounding in wild beasts of almost every class, gave continual opportunities of witnessing the strong contrast in their habits, between the ferocious beasts of prey which fly at the approach of man, and these kind but too often injured companions of the human race. Many times, when we have been traveling over plains where those have fled the moment we appeared in sight, have I turned my eyes toward my dogs to admire their attachment, and have felt a grateful affection toward them for preferring our society to the liberty of other quadrupeds. Often, in the middle of the night, when all my people have been fast asleep around the fire, have I stood to contemplate these faithful animals lying by their side, and have learned to esteem them for their social esteem of mankind. When wandering over pathless deserts, oppressed with vexation and distress at the conduct of my own men, I have turned to these as my only friends, and felt how much inferior to them was man when actuated only by selfish views.

"The familiarity which subsists between this animal and our own race is so common to almost every country of the globe, that any remark upon it must seem superfluous; but I cannot avoid believing that it is the universality of the fact which prevents the greater part of mankind from reflecting duly on the subject. While almost every other quadruped fears man as its most formidable enemy, here is one which regards him as his companion and follows him as his friend. We must not mistake the nature of the case: it is not because we train him to our use, and have made choice of him in preference to other animals, but because this particular species feels a natural desire to be useful to man, and, from spontaneous impulse, attaches itself to him. Were it not so, we should see in various countries an equal familiarity with various other quadrupeds, according to the habits, the taste, or the caprice of different nations. But everywhere it is the dog only that takes delight in associating with us in sharing our abode; he is even jealous that our attention should be bestowed on him alone; it is he who knows us personally, watches for us, and warns us of danger. It is impossible for the naturalist, when taking a survey of the whole animal creation, not to feel a conviction that this friendship between two creatures so different from each other must be the result of the laws of nature; nor can the humane and feeling mind avoid the belief, that kindness to those animals from which he derives continued and essential assistance, is part of his moral duty."

It may be truly said that the dog is the only animal capable of disinterested affection. The horse neighs that he may be fed; he enjoys the chase and feels emulation, and thus shares in some of our pleasures: but the dog desires to follow us, and be useful to us as a friend. He freely sacrifices his appetite and his liberty for our benefit. Queen Mary's lap-dog followed her to the scaffold, caressed the body when the head was cut off, and when forcibly withdrawn, pined away and died. The dog is as true in his affections in the midst of poverty as in abundance. He dines as cheerfully and thankfully on a bone with his pauper master, as on the ruddy roast beef of the lord of the manor. The instance of a cur that followed the body of his master, a poor tailor, to the churchyard of St. Olave, in London, and, refusing to be comforted, after a few weeks wasted away and perished, is familiar to all readers. There are innumerable instances of this sort. One of them, that of a young man who lost his life by falling from one of the precipices of the Helvellyn Mountains, and who for three months was guarded by his faithful dog—wasted at last to a skeleton—has been put into immortal verse by Scott:

"I climb'd the dark brow of the mighty Helvellyn;
Lakes and mountains beneath me gleam'd misty and wide;
All was still, save by fits, where the eagle was yelling,
And starting around me the echoes replied.
On the right, Striden-edge round the Red-tarn was bending,
And Cachedicam its left verge was defending,
One huge nameless rock in the front was ascending,
When I mark'd the sad spot where the wanderer died.

"Dark green was the spot 'mid the brown mountain heather,
Where the Pilgrim of Nature lay stretch'd in decay,
Like the corpse of an outcast abandon'd to weather,
Till the mountain winds wasted the tenantless clay.
Nor yet quite deserted, though lonely extended,
For faithful in death, his mute favorite attended,
The much-loved remains of her master defended,
And chased the hill fox and the raven away.

"How long didst thou think that his silence was slumber?
When the wind waved his garments, how oft didst thou start?
How many long days and long weeks didst thou number,
Ere he faded before thee, the friend of thy heart?"

The general zoological characteristics of this remarkable and interesting species are so familiar that we need only describe them in outline. They are plantigrade, and have non-retractile claws—five on the fore-feet, and four on the hinder ones. They follow either by sight or scent, and hunt singly, or in packs, according to the strength of the prey. The period of gestation in all is sixty-three days; the number of young at a birth, from four to six: all are born blind. The age to which they live varies from six to twenty years. These are permanent and universal attributes; but, in respect to color, form, size, nature of the hair, and the instincts and aptitudes, there is an almost endless variety. There are some differences of a more radical nature, as in the number of the caudal vertebræ, some having more and some less. Some dogs, also, have five toes on the hinder feet. The dentition is also variable in some wild varieties.

Like man himself, the dog is divided into many races, and it is curious that the same doubts which have arisen as to the specific unity of mankind, also exist as to this animal. Whether all dogs sprung from one Adam, or from many, is as much a matter of dispute as whether all the diverse members of the human family descended from the Gardener of Eden, or each race from some unnamed and nameless progenitor.

The prevailing opinion has been, that all the breeds of domestic dogs are descended from one original stock, and that the variations which exist are the result of difference of climate and condition; but what that original stock was or is, has not been agreed upon. Some persons, and among them several able naturalists, consider the wolf as the progenitor of the dog, or, in other words, they hold that the dog is only a tamed and educated wolf. The reasons for this are various. In the first place, it is found that the osteology of the two is nearly the same, though the skull of the wolf is thicker and more arched; the period of gestation and the relative length of the intestines are identical; many of their habits and instincts are similar; the dog and the wolf breed together, and their offspring is prolific, though to what extent is not ascertained. When the dog becomes wild, he grows savage and wolfish in his nature; and many wild dogs resemble the wolf in appearance. The wolf, though generally fierce and savage, can be rendered gentle and affectionate to man, as has been shown in several instances. A she-wolf in the Zoological Gardens of London loved to be noticed by visitors, and she was so anxious to show her pups—which had been littered in the menagerie—and have them caressed, that she absolutely killed them by rubbing them against the bars of the cage.

These facts, it must be admitted, make a strong case; yet they are opposed by other facts even more conclusive. In the first place, the dog appears in history—as we shall have occasion to notice hereafter—from the earliest ages as a distinct species, and bearing generally his present character. Several varieties, known at the present day, are distinctly represented in the monuments of ancient Egypt. In that country, as well as in Ethiopia, at the remotest periods, the dog had already been elevated to a kind of apotheosis. All early traditions represent the dog and wolf as the very opposites of each other—one the friend and ally of man, the other as an enemy and a spoiler.

All this may be considered somewhat remote and speculative; but there are many other facts which go to the same point. The marked difference in temper between the two races—in all times and under all circumstances—must be considered as a weighty argument against identity of species. The dog, too, is found in almost all countries and climates, while the wolf is comparatively

limited in his range. The wild or semi-savage dogs, as the Esquimaux, for instance, are, with few exceptions, afraid of wolves, and fly from them in terror, as if governed by an instinctive aversion. There is a permanent and universal difference in the manner of carrying the tail, that of the dog being curled more or less upward and over the back, while that of the wolf is uniformly low and dragging. The dog of every variety shows a natural disposition to guard property, either his own or that of his master; he is an instinctive sentinel on guard, especially at night—a trait of character not possessed by the wolf.

It is well known that the form of the pupil of the eye is a characteristic of species; in the horse it is oval, in the cat linear, in the dog and wolf it is round. This fact has been appealed to as evidence of the identity of the two animals. But the reply is, that man, and many other creatures, have the round pupil. This, therefore, affords no proof. Two things may, however, be asserted, which seem to go far to settle this question. The eye of the wolf is oblique, and always remains so. There are many races of wild dogs, none of which have ever acquired this characteristic. In fact, as no wolf, to our knowledge, has ever become a dog, so no dog has ever become a wolf.

The difficulty, not to say impossibility, of considering the wolf as the parent of the dog, has led to other suggestions; some hold the jackal to be the progenitor of the dog race, while others consider this animal to be the civilized dog relapsed into barbarism. As these are mere conjectures without proofs, they may safely be dismissed as unworthy of serious consideration. It is a fact well known, that the jackal has a natural odor which is very offensive, and must ever have prevented him from becoming the favorite of man.

Some have imagined the dog to be the offspring of the fox, but this is contradicted by the fact that the pupil of the eye—which, as before remarked, is a permanent and characteristic index to species—is linear and vertical in the fox as in the cat. It may be further added on this point, that, while the corpuscles of the blood of the dog—as in most other mammalia—are circular, in the fox they are oval.

Another suggestion is, that the dog is a cross between two or more members of the family of Canidæ, as between a wolf and jackal, or the jackal and fox, or perhaps the result of a wider mixture of races and varieties. It is easy to see that all this is contrary to the analogy of nature, which, although it presents us with permanent varieties—as is exemplified in various animals, and the dog himself—never creates a prominent and permanent type, having the character of a new species, by means of a mixture of other species. We may add that the fact already stated, of the existence of races of wild dogs, renders any such explanation alike unnecessary and absurd. It matters not whether these races are descendants of an original stock that has remained in their normal state from the beginning, or whether they are the offspring of domesticated breeds, relapsed into savageness: the inference is the same. Just as we know that the wild horse of South America and Texas had a horse for his father—even though he may have been a domesticated animal—so we may infer that the wild dogs of India had dogs for their parents.

In order to understand the full force of this reasoning, let us turn to the accounts which travelers give us of these animals. The dog of the Deccan, called by the Mahrattas *Kolsun*, is also found in Nepaul, where it is called *Buansu*. Its head is elongated and compressed, its nose sharp, its eyes oblique, the pupils round, their irides brown. The ears are long, erect, and somewhat rounded at the top, and the limbs are large and strong. It is of a rufous brown color, and hunts deer, hogs, and other animals in packs of fifty to sixty. It has a coarse, ill-natured expression, but it is not identical with the wolf; it has not even a very close resemblance either to the wolf, fox, or jackal. Though it has peculiarities of construction, which we shall hereafter notice, no one, on seeing it, would hesitate for a moment to say it was a dog, and nothing else. Nor is this the only race of wild dogs; there are many others, more or less resembling this, and whether we consider them as original races, or as descendants of breeds broken loose from domesticity, the inference is the same—that the dog is a permanent and independent type, and not the mere hybrid of other species. If there is any admissible qualification of this conclusion, we conceive it to be this and only this: there may be, and probably are, certain dogs in existence, which have some foreign blood in their veins, either from crossings of the wolf, or fox, or jackal, or a part, or all together. The characters of such animals, in particular instances, may be more or less tinged by



THE CUON, OR BUANSU.

these adventitious mixtures; but we do not believe that any of the established and recognized breeds of dogs are the result of such a process. There is, no doubt, a tendency to branching out into varieties, implanted by nature as well in dogs as other animals, and these varieties, running in the grooves Providence has furnished for them, become fixed and permanent. "It must be observed," says Prichard, speaking of the climatic differences in the hair of dogs, "that these as well as other traits in the breed of dogs have in the first place a relation to climate, but have yet the character of permanent varieties, which remain for generations constant and undeviating. *The varieties of the dog tribe have become permanent varieties.*"

But now arises another question: admitting that the dog is an original and distinct race, are all dogs of the same species? Are the silken lap-dog and the Cuban blood-hound of the same parentage? Are the fox-hound that follows by scent, and the greyhound that follows by sight; the sly lurcher and the frank Newfoundland dog; the submissive spaniel and the gruff mastiff; the terrier that hunts rats, and the bull-dog that pinions a bull; the Dalmatian that struts behind a coach, and the cur that turns up his nose at all the world as he trudges behind a tinker;—are these all of one species? Can we, by any process, conceive the grand and generous ally of the monks of St. Bernard to be of the same race as the impudent and spiteful pug that lives only to snap at every stranger's heels? Can we conceive the sleek, long-legged, graceful Italian greyhound and the vulgar, woolly poodle to be brothers?

These questions have been often put and variously answered. The general conclusion is, alike by those who find the parentage of the dog in the wolf and those who assert its originality, that all the kinds of dogs are of one descent and one species. The diversities which we see in form, size, color, instincts, and aptitudes, and even the differences of structure already alluded to, are all held to be but the results of that principle of variation and development which nature has provided for in many other instances, through the influence of climate and condition.

We have had occasion to illustrate this principle in a former part of this work (p. 42) in its application to other animals, the hog, sheep, ox, goat, &c. It is quite as well authenticated in regard to dogs. The fierce, unconquerable bull-dog, when transported to India, in a few years is altered in form; he loses his courage and ferocity, and becomes a perfect coward. Prichard says:

"It appears that barking is an acquired, hereditary instinct; it has become natural to domesticated dogs and young whelps to learn to bark, even when separated at birth from their parents. It has been conjectured that barking originated in an attempt to imitate the human voice; however that may be, wild dogs do not bark. There are numerous troops of wild dogs in South America, principally in the Pampas. There are also in the Antilles, and in the isles on the coasts of Chili, similar breeds. These, in recovering their liberty, have lost the habit of barking; like other uncultivated breeds of dogs, they only howl. It is known that the two dogs brought by Mackenzie to England from the western parts of America, could never bark, and continued to utter their habitual howl; but a whelp bred from them in Europe learned to bark. It has often been observed, that the dogs in the island of Juan Fernandez, the progeny of those that were left there purposely by the Spaniards before Lord Anson's time, with the design of exterminating the goats, were never known to bark. A curious observation of M. Poulin is, that the cats in South America have in like manner lost those '*miaulemens incommodes*' which are so often heard during the hours of night in many parts of Europe." It would be easy to add many other similar proofs of the plastic nature of dogs, under the influences of climate and condition.

Our conclusion as to the unity and independence of species, in the race of dogs, having the greatest weight of opinion and authority in its favor, as well as the greatest weight of fact and argument, may, we think, be safely adopted, especially as it probably will ever remain impossible to attain absolute certainty on this subject.

It is true that some persons have conjectured that there have been various creations of dogs, of which the several existing breeds are the descendants; but, as there is no evidence whatever of such a fact, and as this furnishes no better explanation of the phenomena which are under discussion than the well-established principles and facts just alluded to, it is hardly worthy of serious consideration.

We are, however, unwilling to close this topic without one final suggestion—partaking as much of feeling, perhaps, as argument—but which is not without its significance. From the earliest periods, as we have already suggested, in which history presents civilized man to our view, we find the dog and the wolf—the former as his friend, and the latter as his enemy; the first as sagacious, faithful, and valuable,—the latter as ferocious, hateful, and destructive, as at the present day. Within the first thousand years after the Deluge, we find that divine honors were paid to the dog, evidently on account of his admirable qualities; it is not possible, therefore, to imagine him to be the descendant of an ignoble brute like the jackal or the fox, and still less of the hostile and tameless wolf. It is true that most savage animals may, in a few cases, become attached to their keepers—those who habitually feed and care for them—but in no other do we find the slightest approach to those qualities which distinguish the dogs,—not as individuals, be it remembered, but as a race. "Man," says Burns, "is the god of the dog: he knows no other. See how he worships him! With what reverence he crouches at his feet: with what reverence he looks up to him: with what delight he fawns upon him: with what cheerful alacrity he obeys him!" Can this relation between man and the dog, beginning and continuing with our race, from its infancy to the present time, be accidental? Is it not rather one of those deep and beneficent provisions which exalt the contemplations of every reflecting and well-balanced mind, in respect to the Creator?

But, as in the case of man, supposing the several tribes and nations to be of one species, we still classify them into distinct groups, so with regard to dogs, they have been arranged into races, according to their affinities.

The following is the classification, according to the development of the frontal sinus and the cerebral cavity, or in other words, the power of scent and the degree of intelligence. It originated



SPANIELS.

with F. Cuvier, and has been adopted by most naturalists. He reckoned three divisions of the dog, as follows:

CLASSIFICATION OF DOGS.

I. Those having the head more or less elongated, and the parietal bones of the skull widest at the base, and gradually approaching each other as they ascend, the condyles of the lower jaw being on the same line with the upper molar teeth. The Danish dog, the dingo of Australia, and the greyhound, with all its varieties, belong to this class.

II. The head moderately elongated, and the parietals diverging from each other for a certain space as they rise upon the side of the head, enlarging the cerebral cavity and the frontal sinus. To this class belong our most valuable dogs,—the spaniel, setter, poodle, pointer, barbet, beagle, harrier, hound, Newfoundland dog, sheep-dog, wolf-dog, Esquimaux dog, &c.

III. The muzzle more or less shortened, the frontal sinus enlarged, and the cranium elevated, and diminished in capacity. To this class belong the bull-dog, some of the terriers, the mastiff, Iceland dog, little Danish dog, English dog, Turkish dog, and a great many others that might very well be spared.

But this division is not adapted to the present state of knowledge on this subject; we shall therefore offer a classification founded on that of Hamilton Smith, with modifications by Gervais and others who have paid especial attention to the subject. This arrangement, however, will only include the domesticated breeds; we shall therefore, in the first place, give a sketch of the most remarkable untamed races.

WILD DOGS.

It is well known that in all countries, dogs occasionally break away from their accustomed training and become wild. Several of these will associate and herd together, and thus breeds of wild dogs, the offspring of domestic ones, are established. These multiply and increase according to the nature of the country in which they are placed. In some of the forests of Germany, among the mountains of the Pyrenees, on the northern shores of the Black Sea, and in various parts of America, North and South, there are wild dogs thus descended from domestic ones. In Asia and in Africa there are also much more numerous bands of wild dogs, many of which have been known for ages, and being of a distinct and permanent character, some naturalists have sought to find in them the origin of the domestic dog.

The Cuon, or Buansu, already mentioned, is the Wild Dog of the Deccan, or Wild Dog of Nepaul, the *Canis primævus* of Hodgson. This animal has some resemblance, in its form, to both the wolf and the jackal; it is in size between the two; its cranium is most like that of the latter. It has six pairs of molars above and below, with one pair of inferior tubercular molars. The color is reddish brown, lighter toward the head, and of a shining blackish hue toward the tail. It unites in packs, which hunt by night and day, following rather by scent than sight, and making prey of hares, rabbits, antelopes, deer, and even buffaloes. They make great havoc among the game, and also destroy some ferocious beasts. While hunting, they have a cry distinct from that of the wolf or jackal, and resembling that of the hound. They inhabit particularly that part of Hindostan called the Deccan, and spread themselves northward to Nepaul, and southward to the coast of Coromandel, occupying as well the plains as the mountains, sometimes even to the verge of perpetual snow. They live in the ravines and crannies of rocks, and never burrow. They are cunning and wary, and seldom permit themselves to be surprised by man. The old dogs are insusceptible of domestication, but the young are readily tamed, and some have as much docility as other dogs. Many of them are partially domesticated in the East, and are used for hunting. They seem, however, to retain their savage and wild character in some degree, and generally are unreliable. In hog-hunting, they are very useful,—the rude sport seeming to suit their snarling and snappish natures. Mr. Hodgson, the English traveler and naturalist, had an excellent opportunity of studying these animals, and he believed he had found in them the original stock of the domestic dog: hence the scientific name he bestowed upon them, as given above. This opinion is not considered valid, but the fact that these animals are neither wolves nor jackals, but dogs, is fully authenticated.

There are, in different parts of India, wild dogs which go under different names; some of them are mere varieties of the Buansu, and other mixed breeds of unknown races. Thus among the Mahrattas, there is a kind called Dhole, the *Chryseus scylex* of Hamilton Smith, which is described as light, compact, and strong, and of the size of a small greyhound. The countenance is lively, the eye brilliant, the hair of a bay color. They are harmless if unmolested, and look upon man rather with curiosity than enmity. They run mute, except a low whimpering note. Their speed is great, and they run down many of the larger and fiercer animals. Some of them are killed in their conflicts with the tiger, the elk, and the wild boar.

The Pariah is the half-domesticated dog of the towns and villages in the East. He is tolerated, but as an outcast: he belongs to no one, dares to enter no house, and goes roaming about and picking up a living in any way he can. He is of a mongrel breed, but yet has some of the amiable qualities of his civilized relatives. Captain Williamson tells us that, in some of the ditches of the Carnatic forts, alligators are purposely kept, and all the pariah dogs found in the forts are thrown into them as provision for these monsters. Some persons who have kept tigers in cages have adopted the same means of supply for their royal captives, putting the poor pariah through an aperture made for the purpose in the cage; and they justify themselves by asserting that they thus get rid of a troublesome breed of curs, most of which are unappropriated, and which, being numerous, are very annoying to passengers, often wantonly biting them, and raising a yelling noise at night, that sets all attempts to rest at defiance.

It does not always happen, however, that the tiger kills the pariah put into his cage. "I knew an instance," says Captain Williamson, "of one that was destined for the tiger's daily meal, standing on the defensive in a manner that completely astonished both the tiger and the spectator. He crept into a corner, and whenever the tiger approached, seized him by the lip or the neck, making him roar most piteously. The tiger, however, impelled by hunger—for all supply of food was purposely withheld—would renew the attack. The result was ever the same. At length the tiger began to treat the dog with more deference, and not only allowed him to partake of the mess of rice and milk furnished daily for his subsistence, but even refrained from any attempt to disturb him. The two animals at length became reconciled to each other, and a strong attachment was formed between them. The dog was then allowed ingress and egress through the aperture; and, considering the cage as his own, he left it and returned to it just as he thought proper. When the tiger died, he moaned the loss of his companion for a considerable period."

It is a curious fact, illustrative of the influence of climate, that in the East, all dogs of European breed become, after every successive generation, more and more similar to the pariah or indigenous dog of that country. The hounds are the most rapid in their decline, and, except in the form of their ears, they are very much like many of the village curs. Greyhounds and pointers also rapidly decline, although with occasional exceptions. Spaniels and terriers deteriorate less, and spaniels of eight or nine generations, and without a cross from Europe, are not only as good as, but far more beautiful than, their ancestors.

In Egypt, Constantinople, and throughout the whole of the East, there are in every village, troops of wandering dogs which belong to no particular person. Each troop has its own quarter of the place; and if one wanders into a part which does not belong to him, its canine inhabitants unite together and chase him out. At the Cape of Good Hope there are many dogs, half-starved. On going from home, the natives induce two or more of these animals to accompany them and warn them of the approach of any ferocious animal. If any of the jackals come near the walls of the town during the night, uttering their piercing cries, the dogs sally out at the signal, and, uniting together, put the jackals to speedy flight.

A wild variety of the pariah exists in Sumatra. It is described by Cuvier as "possessing the countenance of a fox, the eyes oblique, the ears rounded and hairy, the muzzle of a foxy-brown color, the tail bushy and pendulous, very lively, running with the head lifted high, and the ears straight." This animal can scarcely be rendered tractable, and even when he is apparently tamed, can rarely be depended upon.

As we proceed through the Indian Archipelago, toward Australasia, we skirt the coast of Java. Every Javanese of rank has large packs of dogs with which he hunts the muntjak, the deer of that country. These are the indigenous breed of the island,—the body lank, the ears erect, ferocious in their disposition, and with very little attachment to their masters.

Egypt and Nubia present us with the first historical records of the dog; here it was anciently prized and honored on account of its noble qualities, but the aversion of the Jews has passed to the moderns, and at the present day it is held in general contempt and aversion not only throughout these countries, but other parts of Africa. Here, as in India, there are troops of half-wild, outcast dogs in the towns and villages, scouring the streets for offal, and occasionally sweeping in bands over the country in search of prey. The name of this species in Egypt is *Deab;* he is

of considerable size, with a round muzzle, large head, small, erect ears, and long, hairy tail; he is spotted with black, white, and yellow, and has a fierce, wolfish aspect.

In Nubia there is a smaller dog of the same kind, which never burrows. It lives on small animals and birds, and rarely enters any of the towns. A similar dog inhabits the neighborhood of the Cape, and particularly the Karroo or Wilderness. It is smaller than either of the others, and lives among bushes or under prominent rocks. Others, although not identified with the jackal, yet, associating with him, inhabit the uplands of Gambia and Senegal.

On the Gold Coast the dog is used and prized as an article of food. He is fattened and driven to market as the European drives his sheep and hogs. The dog is even more valued than the sheep for human subsistence, and is deemed the greatest luxury that can be placed even on the royal table.

In Loango, or Lower Guinea, there are wild dogs which hunt in large packs; they fearlessly attack even the elephant, and generally destroy him. In the neighborhood of the Cape, the country is nearly cleared of wild beasts; but in Cape Town, as we have stated, there are a great number of lean and miserable dogs, who howl about the streets at night, quitting their dens and lurking-places, in quest of offal. Not long ago, the wolves and hyenas used to descend and dispute the spoil with these dogs, while the town resounded with their hideous howlings all the night long.

The American dogs, whether wild or domestic, are supposed to be descendants of European or Asiatic breeds. The Newfoundland dog, the Labrador dog, the Esquimaux dog, the Hare Indian dog, are races which originated in the northern parts of the continent, probably at no very remote date, from foreign varieties. When America was discovered, the Indians of both divisions of the continent were already in possession of dogs in a half-tamed state, doubtless of nearly the same breeds as those which their descendants still possess. A small species of dog called *Alco*, in two varieties—one the size of a Guinea-pig, and the other larger—was found among the Mexicans and Peruvians, but it appears to have become extinct. Dogs were also found among the Indians of the Caribbean Isles.

The wild dogs of America at the present day are not numerous, except in some parts of South America, where they exist in considerable numbers. These appear to be of various breeds, though most of them are of the race called *Cayotte*, which has a resemblance to the wolf, and has often been described as a species of that animal. The Indians, as well in North as South America, have numerous dogs, mostly derived from the wild breeds. In Mexico and Colombia great numbers of similar dogs are used for the purpose of guarding the droves of horses and herds of cattle—one planter often having many thousands of these creatures. We are told by Dr. Lewis in his excellent edition of "Youatt on the Dog," that "there is a diminutive species of dog running wild, and burrowing in the ground like rabbits, in the neighborhood of Santa Fe and Chihuahua. They are of every variety of hue, and resort to their burrows whenever disturbed in their natural haunts. What they subsist on it is difficult to say, as they are too harmless and insignificant to attack any other animal beyond a mouse or a snail. They are represented as being very difficult to tame, but when domesticated show no disposition to return to their former mode of life. The lady of the Mexican Minister, when in this city, had one of these dogs as a boudoir pet; it was lively, and barked quite fiercely. We have not been able to ascertain whether they bark in their natural state."

The celebrated mastiffs of Thibet, the dingo of Australia, and the Esquimaux dog, are semi-civilized races, and will be noticed with the domesticated breeds.

PRELIMINARY HISTORY OF DOGS.

The classification of the various breeds of dogs we have to propose, like every other, will necessarily be defective, from the want of information as to the races of antiquity, and even some of the existing varieties. We know, indeed, from the sculptures and paintings of ancient Egypt, that in the early ages the people of that country had various breeds of dogs, and some of them were favorites. In these representations we find hounds and greyhounds, pet domestic dogs, turnspits, watch-dogs, and hunting-dogs. Some kinds were regarded with religious veneration,

as their mummies have been found. The Greeks and Romans had watch-dogs, hounds, greyhounds, and spaniels. The latter people were accustomed to send to Britain for the native mastiff of that country. One of the mosaics found at Pompeii represented a dog fastened by a chain, with an inscription, "*Cave canem!*" "Beware of the dog!"

The Israelites appear to have regarded the dog with peculiar abhorrence as an unclean animal, perhaps because of the preference given to it by the Egyptians. In this aversion they have been followed by the Mohammedans. In the Scriptures there are abundant allusions to the dog; as, for example, Exodus, xxii. 31; 1 Kings, xxi. 19 and 23; 2 Kings, ix. 36, and elsewhere. The passages like the following, "In the place where the dogs licked the blood of Naboth, shall dogs lick thy blood, even thine;" "The dogs shall eat Jezebel, by the wall of Jezreel;" bring to mind the description of Byron, who had traveled in the East, and was familiar with the habits of those masterless dogs that "wander up and down for meat, and grudge if they be not satisfied:"

"He saw the lean dogs beneath the wall,
Hold o'er the dead their carnival;
Gorging and growling in carcass and limb,
They were too busy to bark at him.
From a Tartar's skull they had stripp'd the flesh,
As ye peel the fig when the fruit is fresh:
And their white tusks crunch'd o'er the whiter skull,
As it slipp'd through their jaws when their edge grew dull:
As they lazily munch'd the bones of the dead,
As they scarce could rise from the spot where they fed;
So well had they broken a lingering fast,
With those who had fallen for that night's repast."

The aversion of the Israelites to the dog, so far back as the time of the Prophets, is strangely contrasted with the respect entertained for it in Greece. The story of Ulysses and his dog furnishes a striking illustration of this. Twenty years had passed since Argus, the favorite dog of Ulysses, had been parted from his master. The monarch at length wended his way homeward, and, disguised as a beggar, for his life would have been sacrificed had he been known, stood at the entrance of his palace door. There he met with an old dependent who had formerly served him with fidelity, and was yet faithful to his memory; but age and hardship and care, and the disguise which he now wore, had so altered the wanderer, that the good Eumæus had not the most distant suspicion with whom he was conversing; but—

"Near to the gates, conferring as they drew,
Argus the dog his ancient master knew,
And, not unconscious of the voice and tread,
Lifts to the sound his ears, and rears his head.
He knew his lord, he knew, and strove to meet;
In vain he strove to crawl and kiss his feet:
Yet, all he could, his tail, his ears, his eyes,
Salute his master, and confess his joys."

The histories of Greece and Rome, as well as the vestiges of their arts of design, abundantly prove that the dog was as much the attached friend and favorite companion of man in the days of their highest civilization, as he is at the present time among refined and enlightened nations. In all ages he seems to have been used very much as now, for the purposes of the chase, as the playmate of children, the pet of the fair; as the guard of the household at night, the protector of the person by day. It is wonderful to consider the range of useful and agreeable qualities in this species: the fine scent, the admirable speed, the indomitable courage, the amazing strength of some; the surpassing instincts, the playful humor, the winning graces of others; the quick intelligence, loving friendship, and unfailing fidelity of all. In this country we are apt to consider the dog almost exclusively in his ministrations to our pleasures and pastimes. In many parts of Europe—hitched to a small cart—he is the patient and profitable drudge of the poorer classes. Even in our cities, we may see him frequently brought into this service by the ash-man, patiently standing at his post until the load is ready, and then tugging at the draft like a very horse.

There is still another use of the dog, which a regard to the taste of our readers would naturally lead us to omit, but truth compels us to state that this animal is used in some countries as a luxury for the table. This practice is not of modern origin. Many of the Greek and Roman epicures were fond of the flesh of the dog. Galen speaks of it in the strongest terms of praise. Hippocrates says that the meat of old dogs is of a warm and dry quality, giving strength to the eater. Ananias, the poet, speaks of dog's flesh mixed with that of the hare and fox. Virgil recommends that the fatted dog should be served up with whey or butter; and Dioscorides, the physician, says that dogs should be fed on the whey that remains after the making of cheese.

It is not surprising that an animal whose flesh was thus regarded as delicious for food and of powerful hygienic virtues, should be esteemed an acceptable offering to the gods. Accordingly, we find that dogs were sacrificed at certain periods by the Greeks and Romans to almost all their deities, and particularly to Mars, Pluto, and Pan; to Minerva, Proserpine, and Lucina; and also to the Moon, because the dog, by his barking, dispelled all charms and spells, and frightened away all specters and apparitions. The Greeks immolated many dogs in honor of Hecate, because by their baying the phantoms of the lower world were evoked. A great number of dogs were also destroyed in Samothrace in honor of the same goddess. Dogs were periodically sacrificed in February, and also in April and in May; also to the goddess Rubigo, who presided over the corn, and the Bona Dea, whose mysterious rites were performed on Mount Aventine. The dog Cerberus was supposed to be watching at the feet of Pluto, and a dog and a youth were periodically sacrificed to that deity. The night when the Capitol had nearly been destroyed was annually celebrated by the cruel scourging of a dog in the principal public places, even to the death of the animal.

These habits of the ancients naturally passed to the modern nations of Europe, modified, however, by the state of manners. Before Christianity was established among the Danes, on every ninth year, at the winter solstice, a monstrous sacrifice of ninety-nine dogs was offered. In Sweden the sacrifice was still worse. On each of nine successive days, ninety-nine dogs were destroyed. This sacrifice of the dog, however, gave way to one more horrible. On every ninth year, ninety-nine human victims were immolated, and the sons of the reigning tyrant among the rest, in order that the life of the monarch might be prolonged!

The use of the dog for food exists extensively at the present day. We have already spoken of the dogs of Loango, fattened for the shambles. Among the Chinese, dog meat is as well established in the markets as mutton. All the American Indians feed on dogs, as opportunity or occasion offers. Many civilized men, especially voyagers and travelers in the Arctic regions, prompted by hunger, have made their meal on this animal. Some of them, in their narratives, speak of roast-dog with a gusto that veal or venison could hardly provoke.

We now proceed with our classification of dogs, and a brief description of the most remarkable varieties:

DIVISION I.—THE GREYHOUND AND ITS KINDRED.

The Greyhound: *C. familiaris leporarius.*—Of this there is a great variety, all characterized by a small head, slender limbs, and a gaunt form. An old description says:

"A greyhounde should be headed lyke a snake,
And neckyd lyke a drake,
Fotyd lyke a cat,
Tayled lyke a ratte,
Syded like a teme,
And chyned like a bream."

In hunting, greyhounds usually follow by sight, and not by scent. Their name does not indicate their color, as they are of various complexions. They are not of the highest order of intelligence, nor are they distinguished by great attachment to their masters; but many of them are favorites, some for their swiftness in the chase, and others for the extreme elegance of their shape. This breed is mentioned so early as the time of Ovid:

"As when th' impatient greyhound, slipp'd from far,
Bounds o'er the glade to course the fearful hare,
She in her speed does all her safety lay,
And he with double speed pursues the prey;
O'erruns her at the sitting turn, but licks

His chaps in vain, yet blows upon the flix;
She seeks the shelter which the covert gives,
And, gaining it, she doubts if yet she lives."

The English, Scotch, and Irish greyhounds were all of Celtic derivation, and their cultivation and character corresponded with the civilization of the different Celtic tribes. The dogs that were exported from Britain to Rome were probably of this kind. Mr. Blaine gives an account of the progress of these dogs, which seems evidently to be founded in truth: "Scotland, a northern locality, has long been celebrated for its greyhounds, which are known to be large and wiry-coated. They are probably types of the early Celtic greyhounds, which, yielding to the influences of a colder climate than that they came from, became coated with a thick and wiry hair. In Ireland, as being milder in its climate, the frame expanded in bulk, and the coat, although very similar was yet less crisped and wiry. In both localities, there being at that time boars, wolves, and even bears, powerful dogs were required. In England these wild beasts were more early exterminated, and consequently the same kind of dog was not retained, but, on the contrary, was by culture made finer in coat, and of greater beauty in form."



FIDELITY.

The greyhound appears to have been a favorite with the English gentry of the middle ages, and this animal is frequently sculptured at the feet of his master on the old tombs. A late

beautiful engraving, in allusion to the ancient reputation of the greyhound, pictures one of these creatures watching at night by the grave of his friend. Probably this was a different variety from the modern one. A touching memorial of one of the ancient breed exists in the well-known ballad of Gelert, from which we give an extract:



THE GREYHOUND.

"'Twas only at Llewellyn's board
The faithful Gelert fed,
He watch'd, he served, he cheer'd his lord,
And sentinel'd his bed.

In sooth he was a peerless hound,
The gift of royal John;
But now no Gelert could be found,
And all the chase rode on.

And now as over rocks and dells
The gallant chidings rise,
All Snowdon's craggy chaos yells
With many mingled cries.

That day Llewellyn little loved
The chase of hart or hare;
And scant and small the booty proved,
For Gelert was not there.

Unpleased Llewellyn homeward hied;
When near the portal seat
His truant Gelert he espied,
Bounding his lord to greet.

But when he gain'd the castle-door,
Aghast the chieftain stood;
The hound was smear'd with gouts of gore—
His lips and fangs ran blood.

Llewellyn gazed with wild surprise:
Unused such looks to meet,
His favorite check'd his joyful guise,
And crouch'd and lick'd his feet.

Onward in haste Llewellyn pass'd,
And on went Gelert too;
And still where'er his eyes he cast,
Fresh blood-gouts shock'd his view.

O'erturn'd his infant's bed he found,
The blood-stain'd covert rent;
And all around the walls and ground,
With recent blood besprent.

He call'd his child—no voice replied—
He search'd with terror wild:
Blood! blood! he found on every side,
But nowhere found the child.

'Hellhound! by thee my child's devour'd!'
The frantic father cried;
And to the hilt his vengeful sword
He plunged in Gelert's side.

His suppliant, as to earth he fell,
No pity could impart;
But still his Gelert's dying yell
Pass'd heavy o'er his heart.

Aroused by Gelert's dying yell,
Some slumberer waken'd nigh:
What words the parent's joy can tell
To hear his infant cry!

Conceal'd beneath a mangled heap
His hurried search had miss'd,
All glowing from his rosy sleep,
His cherub boy he kiss'd.

Nor scratch had he, nor harm, nor dread,
But the same couch beneath
Lay a great wolf, all torn and dead,
Tremendous still in death.

Ah, what was then Llewellyn's pain!
For now the truth was clear:
The gallant hound the wolf had slain,
To save Llewellyn's heir."

Gelert was no doubt a representative of the race of the English greyhound of his day; but the breed has sadly degenerated. Their speed, however, is rather increased than diminished, for they will outstrip a hare in a straight run, coursing for that animal being now the chief use of the English greyhound. They are also more slight and symmetrical in form than in earlier days, but not having been obliged to contend with the wolf, or the boar, or the stag, they have lost the power for which they once were distinguished.

The Highland Greyhound, or Deer-Hound, is distinguished by his great size and his shaggy hair, which almost covers his face. His limbs are muscular, his back arched, the tail long and curved. He carries his head high, and has a fine, majestic appearance. He sometimes displays ill-temper and ferocity toward persons not of his master's family.

The Irish Greyhound differs from the Scotch, in having shorter and finer hair, of a pale fawn-color, and pendent ears. It is, compared with the Scotch dog, gentle and harmless, perhaps indolent, until roused. It is larger than that animal, some of them being full four feet in length, and proportionately muscular. On this account, and also on account of their determined spirit when roused, they were carefully preserved by some Irish gentlemen. They were



THE SCOTCH GREYHOUND.

formerly used in hunting the wolf when that animal infested the forests of Ireland. Mr. Bell says that the last person who kept the pure breed was Lord Altamont, who in 1780 had eight of them.

The Scotch Greyhound resembles the English in form, but the frame is stronger and more muscular, the hind-quarters more prominent, and the coat rougher and more shaggy: the speed, however, is not so great.

The Russian Greyhound is principally distinguished by its dark-brown or iron-gray color, its short semi-erect ears, its thin lank body, long but muscular legs, and soft thick hair. The hair of its tail forms a spiral twist, or fan—he being thence called the *Fan-tailed Dog*—and as he runs, having a very pleasing appearance. He hunts by scent as well as by sight, and therefore small

packs of this kind are sometimes kept, against which the wolf, or even the bear, would stand little chance. He is principally used for the chase of the deer or the wolf, but occasionally follows the hare. The deer is his principal object of pursuit, and for this he is well adapted. He is met with in most parts of Russia, where his breed is carefully preserved by the nobility, with whom coursing is a favorite diversion.

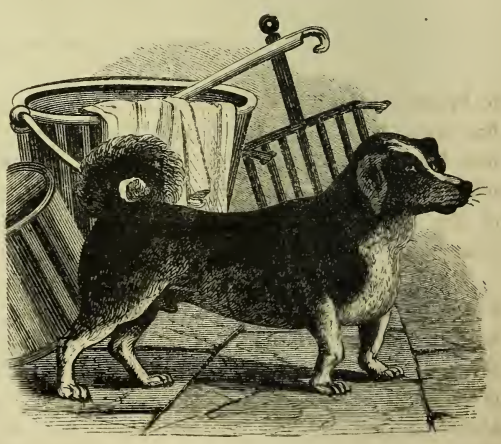
The Grecian Greyhound, whose image was occasionally sculptured on the friezes of the ancient temples, still exists, and a specimen has lately been in the London Zoological Gardens. It greatly resembles the English variety.

The Turkish Greyhound is a small-sized hairless dog, or with only a few hairs on his tail. He is never used in the field, and is bred only as a spoiled pet,—yet not always spoiled, for anecdotes are related of his inviolable attachment to his owner. One of them belonged to a Turkish Pacha who was destroyed by the bowstring. He would not forsake the corpse, but laid himself down by the body of his murdered master, and presently expired.

The Persian Greyhound is a beautiful animal. He is more delicately formed than the English breed; the ears are also more pendulous, and feathered almost as much as those of a King Charles' spaniel. Notwithstanding, however, his apparent slenderness and delicacy, he yields not in courage, and scarcely in strength, to the British dog. There are few kennels in which he is found in which he is not the master. In his native country he is not only used for hunting the hare, but the antelope, the wild ass, and even the boar. The antelope is speedier than the greyhound: therefore the hawk is given to him as an ally. The antelope is no sooner started than the hawk is cast off, who, fluttering before the face of the deer, and sometimes darting his talons into his head, disconcerts him, and enables the greyhound speedily to overtake and master him.

The chase, however, in which the Persians chiefly delight, and for which these greyhounds are mostly valued, is that of the *ghoo-khan*, or wild ass. This animal inhabits the mountainous districts of Persia. He is swift, ferocious, and of great endurance, which, together with the nature of the ground, renders this sport exceedingly dangerous. The hunter scarcely gives the animal a fair chance, for relays of greyhounds are placed at various distances in the surrounding country; so that, when those by which the animal is first started are tired, there are others to continue the chase. Such, however, is the speed and endurance of the ghoo-khan, that it is seldom fairly run down by the greyhounds, its death being usually achieved by the rifle of some horseman. The Persians evince great skill and courage in this dangerous sport, galloping at full speed, rifle in hand, up and down the most precipitous hills, and across ravines and mountain streams, that might well daunt the boldest rider.

The Persian greyhound, carried to Hindostan, is not always to be depended upon; but is said to be apt to console itself by hunting its own master, or any one else, when the game proves too fleet or escapes into the cover.



THE TURNSPIT.

The Italian Greyhound possesses all the symmetry of the English or Persian one, on a small scale. So far as beauty can recommend it, and, generally speaking, good nature, it is deservedly a favorite in the drawing-room; but, like the large greyhound, it is inferior in intelligence. It has no strong individual attachment, but changes it with singular facility.

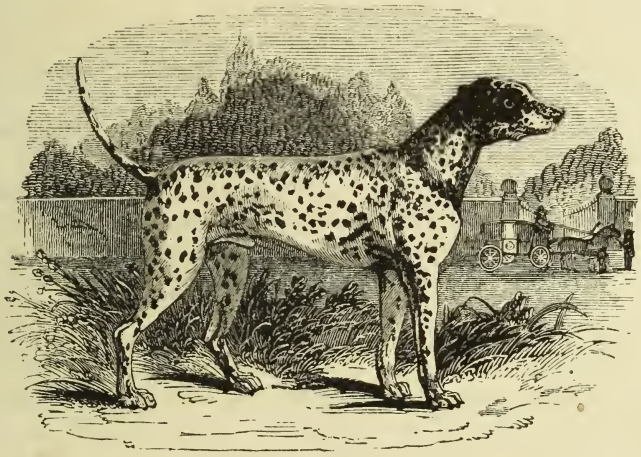
There are many other less noted varieties of the greyhound, for which we have not space. Nor shall we enter largely into a description of the degenerate cousins of the breed, such as the vagabond street-dogs of Egypt, which claim to have greyhound blood in their veins. We must not, however, omit the humble but intelligent Turnspit, which, despite its vulgarity, appears to be, in part, of this gentle stock. In former days

it was an almost universal auxiliary in the kitchens of Europe, but modern improvements in the machinery of cooking have, for the most part, taken away its vocation. It has a long body, with short legs, the tail curled, the ears long and pendent, and the head large in proportion to the body. There are some curious stories of the artfulness with which it often attempted to avoid the tasks imposed upon it. The crooked-legged turnspit is a variety of this dog.

DIVISION II.—THE FRENCH MATIN AND ITS KINDRED.

The Matin—a French word, which literally signifies *mastiff*, but which is technically used to mean the Great French Cur-Dog—is of a breed peculiarly esteemed in France, and was erroneously regarded by Buffon as the progenitor of the dog race. It is the *C. f. laniarius* of Linnæus, and is a very superior animal, of middle size, robust frame, short hair, ears erect, though pendulous at the tip, moderate powers of scent, great activity and endurance, with a somewhat fierce disposition. He is brave even to ferocity, faithful to the death in guarding his master's property, and an excellent tender of herds and flocks—in these respects rivaling the shepherd's dog. He is used in the chase of the boar and the wolf, in which he displays admirable perseverance and daring.

The Dalmatian Dog, or Great Danish Dog, claims a place here. The body is generally white, marked with numerous small round black, or reddish-brown, spots. The Dalmatian is said

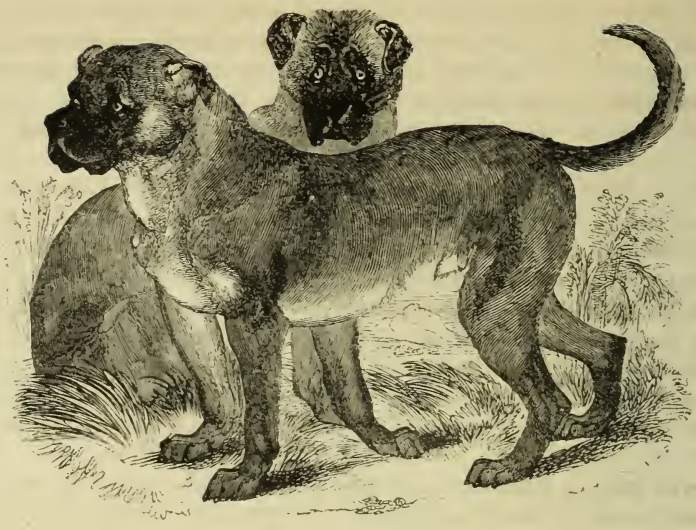


THE DALMATIAN DOG.

to be used in his native country for the chase, to be easily broken, and stanch to his work. He has never been thus employed in England or America, but is chiefly distinguished by his fondness for horses, and as being the frequent attendant on the carriages of the wealthy. To that his office seems to be confined; for he rarely develops sufficient sense or sagacity to be useful in any of the ordinary offices of the dog. Some of this breed are the tallest of the canine species in existence. There is a smaller variety, called the Little Dalmatian Dog.

The Cuban Mastiff, or Cuban Blood-Hound, is of this division. It was a native of Spain, and was sent to the West Indies, where it was used by the Spanish invaders as an ally in their wars with the revolted Indians. It acquired a thirst for human flesh, and became a powerful ally in the dark and bloody history of the period. The priest Las Casas says that the populous island of Cuba, in consequence of the destruction of the natives by means of these dogs, was rendered almost a desert. The present breed is a strong and courageous race, of moderate intelligence: they are used as watch-dogs, and are also in request for bull-fights and other Spanish exhibitions.

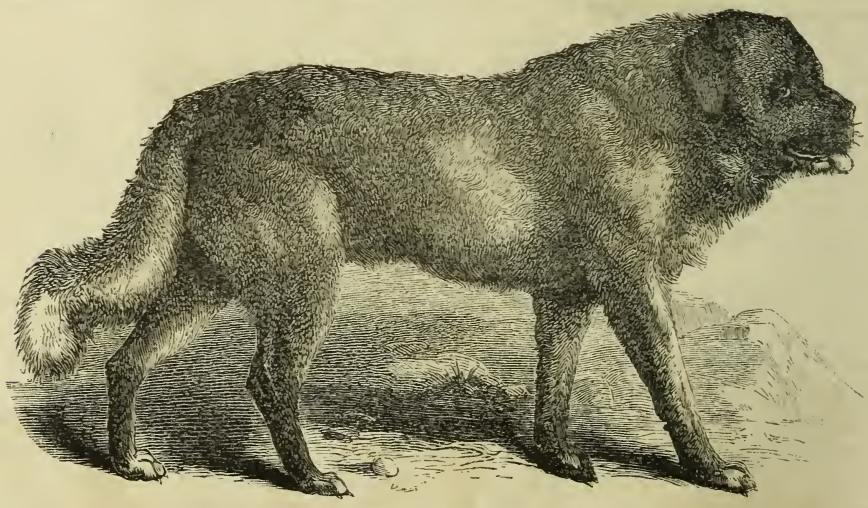
According to Gervais, the primitive turnspit and some of the dogs of the Indians of America were of this division.



THE CUBAN MASTIFF.

DIVISION III.—THE SHAGGY OR WOOLLY BREEDS.

This class embraces several of the most remarkable and interesting species. Their ears, originally straight and erect, have become somewhat pendulous in the more modified breeds. They are frequently of considerable height, and in their habits are active, laborious, and intelligent. They are natives of the countries approaching the Arctic circle.



THE ST. BERNARD DOG.

The Mount St. Bernard Dog, often called the Alpine Spaniel, *C. f. montanus*, is one of the most celebrated of this division. It is almost peculiar to the Alps, and to the district between Switzerland and Savoy. The passes over these mountains are exceedingly dangerous from their steepness and narrowness. A precipice of many hundred feet is often found on one side, and perpendicular rocks on the other, while the path is glazed with frozen snow or ice. In many places the path is overhung with huge masses of frozen snow, which occasionally loosen and fall, when the dreadful storms peculiar to these regions suddenly come on, and form an insurmountable barrier, or sweep away or bury the unfortunate traveler. Should he escape these dangers, the road is now become trackless, and he wanders amid the dreary solitudes until night overtakes

him; and then, when he pauses from fatigue or uncertainty with regard to the path he should pursue, his limbs are speedily benumbed. Fatal slumbers, which he cannot shake off, steal upon him, and he crouches under some ledge, and sleeps to wake no more. The snow drifts on. It is almost continually falling, and he is soon concealed from all human help.

On the top of Mount St. Bernard, and near one of the most dangerous of these passes, is a convent, in which is preserved a breed of large dogs trained to search for the benighted and frozen wanderer. Every night, and particularly when the wind blows tempestuously, some of these dogs are sent out. They traverse every path about the mountains, and their scent is so exquisite that they can discover the traveler, although he may lie many feet deep in the snow. Having found him, they set to work and endeavor to scrape away the snow, uttering a deep bark that reverberates from rock to rock, and tells those who are watching in the convent that some poor wretch is in peril. Generally, a little flask of spirits is tied round the neck of the animal, by drinking which the benighted traveler may recruit his strength, until more effectual help arrives. The monks hasten in the direction of the sound, and often succeed in rekindling the vital spark before it is quite extinguished. Very many travelers have been thus rescued from death by these benevolent men and their intelligent and interesting quadruped servants.

One of these Bernardine dogs, named Barry, had a medal tied round his neck as a badge of honorable distinction, for he had saved the lives of forty persons. He at length died nobly in his vocation. A Piedmontese courier arrived at St. Bernard on a very stormy day, laboring to make his way to the little village of St. Pierre, in the valley beneath the mountain, where his wife and children lived. It was in vain that the monks attempted to check his resolution to reach his family. They at last gave him two guides, each of whom was accompanied by a dog, one of which was the remarkable creature whose services had been so valuable. Descending from the convent, they were overwhelmed by two avalanches or heaps of falling snow, and the same destruction awaited the family of the poor courier, who were traveling up the mountain in the hope of obtaining some news of the husband and father.



THE NEWFOUNDLAND DOG.

The Newfoundland Dog, *C. f. Terræ Novæ*, originated in the island which has given it name, and is probably derived from a cross of a dog carried thither by the English settlers and a native breed. These animals are of large size, and in almost every part of British America they

are valuable and useful. They are remarkably docile and obedient to their masters, serviceable in all the fishing countries, and, yoked in pairs, draw the winter's fuel home. They are faithful, good-natured, and ever friendly to man. They will defend their master and their master's property, and suffer no person to injure either the one or the other; and, however extreme may be the danger, they will not leave them for an instant. They seem only to want the faculty of speech in order to make their good wishes and feelings understood, and they are capable of being trained for all the purposes for which every other variety of the canine species is used.

They are fond of the water, and having powerful limbs, and broad, webbed feet, are excellent swimmers. No other dog can compare with them in this element. They may be made exceedingly useful to the sportsman in pursuing water-fowl. Dr. Lewis gives a curious and interesting account of the manner in which a breed of these dogs are used on the Chesapeake in drawing the flocks of canvas-back ducks within range of the sporting parties. With one of these animals, the sportsmen, "consisting of several persons all prepared with heavy double-barreled duck-guns, ensconce themselves at break of day behind some one of the numerous blinds temporarily erected along the shore, contiguous to the feeding-grounds of these ducks. Every thing being arranged, and the morning mists cleared off, the ducks will be seen securely feeding on the shallows, not less than several hundreds of yards from the shore. The dog is now put in motion by throwing stones from one side of the blind to the other. This will soon be perceived by the ducks, who, stimulated by an extreme degree of curiosity, and feeling anxious to inform themselves as to this sudden and singular phenomenon, raise their heads high in the water and commence swimming for the shore. The dog being kept in motion, the ducks will not arrest their progress until within a few feet of the water's edge, and oftentimes will stand on the shore staring, as it were, in mute and silly astonishment at the playful motions of the dog. If well trained, the dog takes no notice whatever of the ducks, but continues his fascination until the quick report of the battery announces to him that his services are now wanted in another quarter, and he immediately rushes into the water to arrest the flight of the maimed and wounded, who, struggling on every side, dye the water with their rich blood."

It is not for sporting, however, that the Newfoundland breed are chiefly used. They are excellent guardians of the house, and exceedingly pleasant companions, as well for the old as the young. They have acquired great reputation for rescuing drowning persons from the water. A few anecdotes, among the many on record, will illustrate this trait of character.

"A native of Germany was traveling one evening on foot through Holland, accompanied by a dog of this breed. Walking on a high bank which formed one side of a dyke, his foot slipped, and he was precipitated into the water, and being unable to swim, soon became senseless. When he recovered his recollection, he found himself in a cottage on the opposite side of the dyke, surrounded by peasants, who had been using the means for the recovery of drowned persons. The account given by one of them was, that, returning home from his labor, he observed at a considerable distance a large dog in the water, swimming and dragging, and sometimes pushing along something that he seemed to have great difficulty in supporting, but which he at length succeeded in getting into a small creek on the opposite side. When the animal had pulled what he had hitherto supported, as far out of the water as he was able, the peasant discovered that it was the body of a man, whose face and hands the dog was industriously licking. The peasant hastened to a bridge across the dyke, and having obtained assistance, the body was conveyed to a neighboring house, where proper means soon restored the drowned man to life."

Dr. Beattie relates an instance of a gentleman attempting to cross the river Dee, then frozen over, near Aberdeen, Scotland. The ice gave way about the middle of the river; but having a gun in his hand, he supported himself by placing it across the opening. His dog then ran to a neighboring village, where, with the most significant gestures, he pulled a man by the coat, and prevailed on him to follow him. They arrived at the spot just in time to save the drowning man's life.

One other story should not be omitted of this noble breed of dogs. A vessel was driven on the beach of Lydd, in Kent, England. The surf was rolling furiously. Eight poor fellows were crying for help, but not a boat could be got off to their assistance. At length a gentleman

came on the beach accompanied by his Newfoundland dog. He directed the attention of the animal to the vessel, and put a short stick into his mouth. The intelligent and courageous fellow at once understood his meaning, sprang into the sea, and fought his way through the waves. He could not, however, get close enough to the vessel to deliver that with which he was charged; but the crew understood what was meant, and they made fast a rope to another piece of wood, and threw it toward him. The noble beast dropped his own piece of wood, and immediately seized that which had been cast to him, and then, with a degree of strength and determination scarcely credible—for he was again and again lost under the waves—he dragged it through the surge and delivered it to his master. A line of communication was thus formed, and every man on board was rescued.

It would be easy to fill pages of similar instances. This animal is at the same time of a very noble disposition—an instance of which is thus related by Dr. Abel:

"When this dog left his master's house, he was often assailed by a number of little noisy dogs in the street. He usually passed them with apparent unconcern, as if they were beneath his notice; but one little cur was particularly troublesome, and at length carried his impudence so far as to bite the Newfoundland dog in the leg. This was a degree of wanton insult beyond what he could patiently endure, and he instantly turned round, ran after the offender, and seized him by the skin of the back. In this way he carried him in his mouth to the quay, and, holding him some time over the water, at length dropped him into it. He did not, however, seem to design that the culprit should be punished, capitally. He waited a little while, until the poor animal, who was unused to that element, was not only well ducked, but nearly sinking, and then plunged in, and brought him safe to land."

It appears that there are two breeds of the Newfoundland dog well known to dog-fanciers—one very large, and the other smaller, but noted for its intelligence. Specimens of this latter have been taken to Europe, and used as retrievers. They are principally valuable for the fearless manner in which they will penetrate the thickest cover. They are exceedingly muscular, strong, and generally black.

The celebrated epitaph of Lord Byron upon an animal of this interesting variety vividly paints the virtues of the race:

"When some proud man returns to earth,
Unknown to glory, but upheld by birth,
The sculptor's art exhausts the pomp of woe,
And storied urns record who rests below.
When all is done, upon the tomb is seen—
Not what he was, but what he should have been.
But the poor dog, in life the firmest friend,
The first to welcome, foremost to defend,
Whose honest heart is still his master's own,
Who labors, fights, lives, breathes for him alone,
Unhonor'd falls, unnoticed all his worth,
Denied in heaven the soul he had on earth:
While man, vain insect, hopes to be forgiven,
And claims himself a sole, exclusive heaven.
O man! thou feeble tenant of an hour,
Debased by slavery, or corrupt by power,
Who knows thee well must quit thee with disgust,
Degraded mass of animated dust!
Thy love is lust, thy friendship all a cheat;
Thy smiles hypocrisy, thy words deceit!
By nature vile, ennobling but by name,
Each kindred brute might bid thee blush for shame.
Ye, who perchance behold this simple urn,
Pass on—it honors none you wish to mourn:
To mark a friend's remains these stones arise;
I never knew but one—and here he lies."

The Labrador Dog is a large and fine animal, resembling the Newfoundland dog. The Esquimaux Dog, *C. f. borealis*, is a remarkable breed, about the size of a pointer, robust and well proportioned, with upright and pointed ears, strong, thick-set legs, and a long bushy tail.



ESQUIMAUX DOGS.

In winter the hair is three or four inches long: under this is a coating of fine close wool, which drops off in the spring. They have the half-savage character of the people with whom they are bred. When the Esquimaux goes in pursuit of the seal, the reindeer, or the bear, these dogs carry the materials of his temporary hut, and his few simple necessaries of life. Sometimes they assist in the chase, and run down and kill the bear and reindeer on the land, and the seal on the coast. A few are used as beasts of burden in summer, and each will carry from thirty to fifty pounds. The majority, however, are sent adrift at this season, and pick up a living by hunting wild animals, or feeding on fish along the coast, or by thieving around the settlements. When winter sets in, they return to their several masters, and then their services become important. They are harnessed by ropes to the sledges, which they draw over the snow at great speed, carrying their master and his family wherever they desire to go.

Capt. Lyon informs us that three dogs drew a sledge weighing one hundred pounds and himself one mile in six minutes; his leader dog, which is generally more powerful than the others, drew one hundred and ninety-six pounds the same distance in eight minutes; seven dogs ran one mile in four minutes and thirty seconds, with a heavy sledge full of men attached to them; ten dogs ran one mile in five minutes; nine dogs drew one thousand six hundred and eleven pounds the same distance in nine minutes.

They have been known for several successive days to travel more than sixty miles. They seldom miss their road, although they may be driven over an untrodden snowy plain, where they are occasionally unable to reach any place of shelter. When, however, night comes, they partake with their master of the scanty fare which the sledge will afford, and, crowding round, keep him warm and defend him from danger. If any of them fall victims to the hardships to which they are exposed, their master or their companions frequently feed on their remains, and their skins are converted into warm and comfortable dresses.

The manner of these creatures in harness is thus described by Capt. Parry:

"A number of dogs, varying from six to twelve, are attached to each sledge by means of a single trace, but with no reins. An old and tried dog is placed as the leader, who, in their simple journeys, and when the chase is the object, steadily obeys the voice of the driver sitting in front

of the sledge, with a whip long enough to reach the leader. This whip, however, is used as seldom as possible; for these dogs, although tractable, are ferocious, and will endure little correction. When the whip is applied with severity on one, he falls upon and worries his neighbor, and he, in his turn, attacks a third, and there is a scene of universal confusion; or the dogs double from side to side to avoid the whip, and the traces become entangled, and the safety of the sledge endangered. The carriage must then be stopped, each dog put into his proper place, and the traces readjusted. This frequently happens several times in the course of the day. The driver, therefore, depends principally on the docility of the leader, who, with admirable precision, quickens or slackens his pace, and starts off or stops, or turns to the right or left, at the summons of his master. When they are journeying homeward, or traveling to some spot to which the leader has been accustomed to go, he is generally suffered to pursue his own course; for, although every trace of the road is lost in the drifting snow, he scents it out, and follows it with undeviating accuracy. Even the leader, however, is not always under the control of his master. If the journey lies homeward, he will go his own pace, and that is usually at the top of his speed; or, if any game starts, or he scents it at a distance, no command of his driver will restrain him. Neither the dog nor his master is half civilized or subdued."

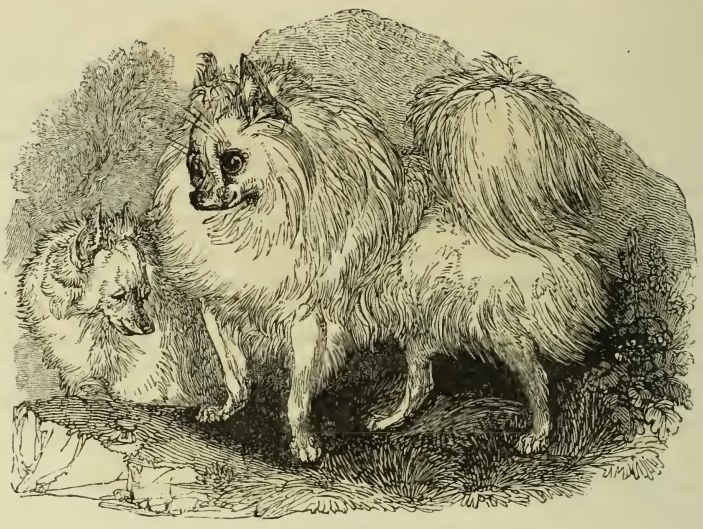
The Greenland, and Siberian, and Kamtschatkadale Dogs are varieties of the Esquimaux or Arctic dogs, but enlarged in form, and better subdued. The docility of some of these is equal to that of any European breed. The following pleasant story is told of one of them:

"A person of the name of Chabert, who was afterward better known by the title of 'Fire King,' had a beautiful Siberian dog, who would draw him in a light carriage twenty miles a day. He asked one thousand dollars for him, and sold him for a considerable portion of that sum; for he was a most beautiful animal of his kind, and as docile as he was beautiful. Between the sale and the delivery, the dog fell and broke his leg. Chabert, to whom the price agreed on was of immense consequence, was in despair. He took the dog at night to a veterinary surgeon. He formally introduced them to each other. He talked to the dog, pointed to his own leg, limped around the room, then requested the surgeon to apply some bandages around the leg, and he seemed to walk sound and well. He patted the dog on the head, who was looking alternately at him and the surgeon, desired the surgeon to pat him, and to offer him his hand to lick, and then, holding up his finger to the dog, and gently shaking his head, quitted the room and the house. The dog immediately laid himself down, and submitted to a reduction of the fracture, and the bandaging of the limb, without a motion, except once or twice licking the hand of the operator. He was quite submissive, and in a manner motionless, day after day, until, at the expiration of a month, the limb was sound. Not a trace of the fracture was to be detected, and the purchaser, who is now living, knew nothing about it."

The Lapland Dog appears to be a very active and sagacious variety of the Arctic breed.

The Hare Indian Dog.—This species is marked by a sharp muzzle, ears erect and pointed, and a lively, cheerful, and pleasing aspect. The hair is white, with patches of grayish black and brown. They are good tempered and manageable, and are used by the Hare Indians in the neighborhood of Mackenzie's River and the Great Bear Lake, chiefly in the chase. They have broad feet and light forms, and thus pass easily over the snow. They run down and overtake the moose and deer, and keep them at bay till the hunters come up and dispatch them. They never bark; but one that was born and bred in the Zoological Gardens of London barked like other dogs.

The Iceland Dog has a roundish head, ears partly erect and partly pendent; the fur soft, and very long, especially behind the fore-legs and on the tail. It is exceedingly useful to the Icelanders while traveling over the snowy deserts of the north. By a kind of intuition it rarely fails in choosing the shortest and the safest course. It is also more aware than its master of the approach of the snow-storms, and is a most valuable ally against the attack of the Polar bear, who, drifted on masses of ice from the neighboring continent, often commits depredations among the cattle, and even attacks human beings. When the dog is first aware of the neighborhood of the bear, he sets up a fearful howl, and men and dogs hasten to hunt down and destroy the depredator.



THE ICELAND DOG.

The traveling in Iceland is sometimes exceedingly dangerous at the beginning of the winter. A thin layer of snow covers and conceals some of the chasms with which that region abounds. Should the traveler fall into one of them, the dog proves a most useful animal; for he runs immediately across the snowy waste, and by his howling induces the traveler's friends to hasten to his rescue.

The Shepherd's Dog, though little used in the United States, is universally known as one of the most interesting of the dog species. It possesses much of the same form and character in every country. The muzzle is sharp, the ears are short and nearly erect, and the animal is covered, particularly about the neck, with thick and shaggy hair. He has usually two dew-claws on each of the hind-legs—not, however, as in the one claw of other dogs, having a jointed attachment to the limb, but merely connected by the skin and some slight cellular substance. The tail is long, and slightly turned upward, and is almost as bushy as that of a fox. He is of a black color, or black prevails, mixed with gray or brown.

There are several breeds of the sheep-dog, used in different countries for different purposes. Some of the larger and more powerful kinds are employed, among other duties, to guard the flock from the wolf. In such cases, the sheep, on the slightest alarm, rally round the dog, as if conscious that he is their protector. Whatever differences there may be in the breeds, they have all the same substantial character of intelligence and devotion to their duties. Other dogs—the pointer, the setter, the hound, the greyhound, the terrier, the spaniel—have each admirable gifts of nature, heightened by training; but the shepherd's dog surpasses them all in adaptation to his work. If he be but with his master, he lies content, indifferent to every surrounding object, seemingly half asleep and half awake, rarely mingling with his kind, rarely courting, and generally shrinking from, the notice of a stranger; but the moment duty calls, his sleepy, listless eye becomes brightened; he eagerly gazes on his master, inquires and comprehends all he is to do, and, springing up, gives himself to the discharge of his duty with a sagacity, and fidelity, and devotion, too rarely equaled even by man himself.

James Hogg, the celebrated Ettrick Shepherd, living in his early days among the sheep and their quadruped attendants, and an accurate observer of nature, as well as an exquisite poet, gives some anecdotes of the colley—the Highland term for sheep-dog—with which the reader will not be displeased: "My dog Sirrah," says he, in a letter to the Editor of Blackwood's Edinburgh Magazine, "was, beyond all comparison, the best dog I ever saw. He had a somewhat surly and unsocial temper, disdaining all flattery, and refusing to be caressed; but his attention to my commands and interest will never again be equaled by any of the canine race. When I first saw him, a drover was leading him with a rope. He was both lean and hungry, and far from being



THE SHEEP-DOG, OR SHEPHERD'S DOG.

a beautiful animal; for he was almost black, and had a grim face, striped with dark brown. I thought I perceived a sort of sullen intelligence in his countenance, notwithstanding his dejected and forlorn appearance, and I bought him. He was scarcely a year old, and knew so little of herding, that he had never turned a sheep in his life; but, as soon as he discovered that it was his duty to do so, and that it obliged me, I can never forget with what anxiety and eagerness he learned his different evolutions; and when I once made him understand a direction, he never forgot or mistook it."

One night, a large flock of lambs that were under the Ettrick Shepherd's care, frightened by something, scampered away in three different directions across the hills, in spite of all that he could do to keep them together. "Sirrah," said the shepherd, "they're a' awa!"

It was too dark for the dog and his master to see each other at any considerable distance, but Sirrah understood him, and set off after the fugitives. The night passed on, and Hogg and his assistant traversed every neighboring hill in anxious but fruitless search for the lambs; but he could hear nothing of them nor of the dog, and he was returning to his master with the doleful intelligence that he had lost all his lambs. "On our way home, however," says he, "we discovered a lot of lambs at the bottom of a deep ravine called the Flesh Cleuch, and the indefatigable Sirrah standing in front of them, looking round for some relief, but still true to his charge. We concluded that it was one of the divisions which Sirrah had been unable to manage, until he came to that commanding situation. But what was our astonishment when we discovered that not one lamb of the flock was missing! How he had got all the divisions collected in the dark, is beyond my comprehension. The charge was left entirely to himself from midnight until the rising sun; and, if all the shepherds in the forest had been there to have assisted him, they could not have effected it with greater promptitude. All that I can say is, that I never felt so grateful to any creature under the sun as I did to my honest Sirrah that morning."

A shepherd, in one of his excursions over the Grampian Hills to collect his scattered flock, took with him—according to a common practice, to initiate them in their future business—one of his children about four years old. After traversing his pastures for a while, attended by his dog, he was compelled to ascend a summit at some distance. As the ascent was too great for the child, he left him at the bottom, with strict injunctions not to move from the place. Scarcely, however, had he gained the height, when one of the Scotch mists, of frequent occurrence, suddenly came on, and almost changed the day to night. He returned to seek his child, but was unable to find him, and concluded a long and fruitless search by coming distracted to his cottage. His poor dog also was missing in the general confusion. On the next morning by daylight he renewed his search, but again he came back without his child. He found, however, that during

his absence his dog had been home, and, on receiving his allowance of food, instantly departed. For four successive days the shepherd continued his search with the same bad fortune, the dog as readily coming for his meal and departing. Struck by this singular circumstance, he determined to follow the dog, who departed as usual with his piece of cake. The animal led the way to a cataract at some distance from the spot where the child had been left. It was a rugged and almost perpendicular descent which the dog took, and he disappeared in a cave, the mouth of which was almost on a level with the torrent. The shepherd with difficulty followed; but, on entering the cavern, what were his emotions when he beheld the infant eating the cake which the dog had just brought to him, while the faithful animal stood by, eyeing his young charge with the utmost complacency! From the situation in which the child was found, it appeared that he had wandered to the brink of the precipice, and then either fallen or scrambled down, the torrent preventing his return. The dog, by means of his scent, had traced him to the spot, and afterward prevented him from starving by giving up a part, or, perhaps, the whole of his own daily allowance. He appears never to have quitted the child night or day, except for food, as he was seen running at full speed to and from the cottage.

Hogg tells us, and very truly, that a single shepherd and his dog will accomplish more in gathering a flock of sheep from a Highland farm than twenty shepherds could do without dogs; in fact, that without this docile animal the pastoral life would be a mere blank. It would require more hands to manage a flock of sheep, gather them from the hills, force them into houses and folds, and drive them to markets, than the profits of the whole flock would be capable of maintaining. Well may the shepherd feel an interest in his dog: he it is indeed that earns the family bread, with the smallest morsel of which he is himself content,—always grateful, and always ready to exert his utmost abilities in his master's interests. Neither hunger, fatigue, nor the worst treatment will drive him from his side, and he will follow him through every hardship without murmur or repining. If one of them is obliged to change masters, it is sometimes long before he will acknowledge the new owner, or condescend to work for him with the willingness that he did for his former lord; but, if he once acknowledges him, he continues attached to him until death.

Buffon gives the following eloquent portrait of the sheep-dog: "This animal, faithful to man, will always preserve a portion of his empire and a degree of superiority over other beings. He reigns at the head of his flock, and makes himself better understood than the voice of the shepherd. Safety, order, and discipline are the fruits of his vigilance and activity. They are a people submitted to his management, whom he conducts and protects, and against whom he never employs force but for the preservation of good order. If we consider that this animal, notwithstanding his ugliness and his wild and melancholy look, is superior in instinct to all others; that he has a decided character in which education has comparatively little share; that he is the only animal born perfectly trained for the service of others; that, guided by natural powers alone, he applies himself to the care of our flocks, a duty which he executes with singular assiduity, vigilance, and fidelity; that he conducts them with an admirable intelligence which is a part and portion of himself; that his sagacity astonishes at the same time that it gives repose to his master, while it requires great time and trouble to instruct other dogs for the purposes to which they are destined:—if we reflect on these facts, we shall be confirmed in the opinion that the shepherd's dog is the true dog of nature, the stock and model of the whole species."

The Italian or Pomeranian Wolf-Dog is mostly covered with grayish hair, short on the head, ears, and feet, and long and silky on the body and tail. It is a superior breed, greatly attached to its master, and is used as a sheep-dog, especially in countries where the sheep are liable to attacks from the wolf.

The Drover's Dog is common in England, and possesses all the docility of the sheep-dog. The following story, among many similar ones, is proof of his sagacity and fidelity: A butcher was accustomed to purchase sheep and kine in the vicinity, which, when fattened, he drove to Alston market and sold. In these excursions he was frequently astonished at the peculiar sagacity of his dog, and at the more than common readiness and dexterity with which he managed the cattle;



POMERANIAN WOLF-DOG.

until at length he troubled himself very little about the matter, but, riding carelessly along, used to be amused with observing how adroitly the dog acquitted himself of his charge. At length, so convinced was he of his sagacity, as well as fidelity, that he laid a wager that he would intrust the dog with a number of sheep and oxen, and let him drive them alone and unattended to Alston market. It was stipulated that no one should be within sight or hearing who had the least control over the dog, nor was any spectator to interfere. This extraordinary animal accordingly proceeded with his business in the most steady and dexterous manner; and, although he had frequently to drive his charge through other herds that were grazing, he did not lose one; but, conducting them to the very yard to which he was used to drive cattle when with his master, he significantly delivered them up to the person appointed to receive them by barking at his door! When the path which he traveled lay through grounds in which others were grazing, he would run forward, stop his own drove, and then, chasing the others away, collect his scattered charge, and proceed.

DIVISION IV.—HUNTING-DOGS, HOUNDS, AND SPANIELS.

These animals are generally of middling size, though some are small; the ears are long and pendent, the scent acute, and the intelligence great. In general, the covering is smooth, though instances of rough hair occur.

The Old English Hound is supposed to be the original stock of the island of Great Britain, and was used by the natives in the chase. It is of large size, long body, deep chest, ears very large and pendulous, a peculiarly deep voice, heavy appearance, and slow movement in the chase. It is now almost extinct, having given way to the swifter breed now in use.

The Fox-Hound, the much celebrated and esteemed hunting-dog in England, is a cross of the old English hound by the greyhound; it is from twenty-two inches to two feet in height, and of middle size. The head and fur are of great beauty, the scent exquisite, and the speed great—equal to the swiftest horse. Youatt tells us that "a match was run over the Beacon Course at Newmarket, the distance being four miles one furlong and one hundred and thirty-two yards. The winning dog performed it in eight minutes and a few seconds; but of the sixty horses that started with the hounds, only twelve were able to run in with them. Flying Childers had run the same course in seven minutes and thirty seconds."

The fox-hound is bred in England with the greatest care by the gentry, and is used in hunting the fox, esteemed the most aristocratic sport in the country. Several gentlemen keep packs of hounds, varying from thirty to sixty dogs,—three thousand dollars a year being frequently



OLD ENGLISH HOUND.

expended on a single pack. A pack of hounds sometimes costs two thousand guineas in the first purchase, and that sum has even been paid for ten couples of a favorite breed. Often several packs are united in the hunt. The fox is run down, it being esteemed a mean and unworthy act to shoot one of these animals. The fox is indeed considered as designed for the sport of the gentry, and to dispose of it in any other manner than for their pleasure is an offense against good society. Every thing that experience, money, and skill can suggest to give dignity and zest to this sport, is employed. Books are written upon every branch of the subject. Magazines are devoted to it; men are brought up and carefully trained in the profession of breeding and breaking horses and dogs for the chase. There are dog-breeders, dog-trainers, dog-physicians, dog-surgeons, dog-architects, and each is honored in his way. Nay, we are told by a celebrated writer on field-sports, that the hunter himself should be carefully disciplined—as if the fox-chase were the great end of life. "A huntsman," says Beckford, "should be attached to the sport, and indefatigable, young, strong, active, bold, and enterprising in the pursuit of it. He should be sensible, good-tempered, sober, exact, and cleanly—a good groom and an excellent horseman. His voice should be strong and clear, with an eye so quick as to perceive which of his hounds carries the scent when all are running, and an ear so excellent as to distinguish the leading hounds when he does not see them. He should be quiet, patient, and without conceit. Such are the qualities which constitute perfection in a huntsman. He should not, however, be too fond of displaying them until called forth by necessity; it being a peculiar and distinguished trait in his character to let his hounds alone while they thus hunt, and have genius to assist them when they cannot."

In illustration of the extent to which sporting is carried on in England, we may state that the dog-kennel of the Duke of Richmond cost thirty thousand dollars. Youatt tells us with an evident feeling of admiration, that in its construction the duke was his own architect, assisted by, and under the guidance of, Mr. Wyatt. "He dug his own flints, burned his own lime, and conducted the wood-work in his own shops. This dog-kennel is a grand object when viewed from Goodwood. The front is handsome, the ground well raised about it, and the general effect good; the open court in the center adds materially to the noble appearance of the building. The entrance to the kennel is delineated in the center with a flight of stairs leading above. The huntsmen's rooms, four in number, first present themselves; each of them is fifteen feet four inches, by fourteen feet six inches. At each end of the side toward the court is one of the feeding-rooms, twenty-nine feet by fourteen feet four inches, and nobly-constructed rooms they are. At the back of the feeding-rooms are one set of the lodging-rooms, from thirty-five feet six



THE FOX-HOUND.

inches, to fourteen feet four inches, and at either extremity is another lodging-room, thirty-two feet six inches in length, and fourteen feet six inches in width. Coming into the court, we find the store-room twenty-four feet by fourteen and a half, and the stable of the same dimensions. At the top of the buildings are openings for the admission of cold air, and stoves to warm the air when too cold. There are plentiful supplies of water from tanks holding ten thousand gallons; so that there is no inconvenience from the smell. Round the whole building is a pavement five feet wide; airy yards and places for breeding, &c., making part of each wing. For the huntsman and whipper-in there are sleeping-rooms, and a neat parlor or kitchen."

The hunting metropolis of Great Britain is Melton-Mowbray, in Leicestershire, and such is the scale on which the sport is conducted, that the place has stabling for a thousand horses. The hunting season lasts from the beginning of November to the end of March. During this period the town is frequented by the leading sportsmen of the Three Kingdoms, and some from the continent, and even from America. The sport is conducted with unrivaled tact, science, and splendor. Noblemen of the highest rank, princes, statesmen, soldiers, scholars, mingle in the exciting chase. The horses are of the finest breed and blood, and are trained in the perfection of art. A party of fifty gentlemen, with as many retainers, and a hundred dogs, scampering over the rich and beautiful country, filling the air with the cry of hound and horn, is a most imposing spectacle.

The Stag-Hound is distinguished from the fox-hound by the apparent broadness and shortness of his head, his longer cheek, his straighter hock, his wider thigh, and deeper chest, and better feathered and more beautifully arched tail. His appearance indicates strength and stoutness, in which indeed he is unequaled, and he has sufficient speed to render it difficult for the best horses long to keep pace with him. This animal, as its name imports, is used for the chase of the deer, which is deemed a royal sport. The stag-hounds are now a part of the regular Crown establishment. The royal kennel is situated upon Ascot Heath, about six miles from Windsor. At the distance of a mile from the kennel is Swinley Lodge, the official residence of the Master of the Stag-Hounds.

The chase of the stag appears to be very exciting sport. When one of them first hears the cry of the hounds, he runs with the swiftness of the wind, and continues to run as long as any sound of his pursuers can be distinguished. That having ceased, he pauses and looks carefully around him; but before he can determine what course to pursue, the cry of the pack again forces itself upon his attention. Once more he darts away, and after a while again pauses. His strength perhaps begins to fail, and he has recourse to stratagem in order to escape. He practices the doubling and the crossing of the fox or the hare. This being useless, he attempts to escape



FOX-CHASE IN ENGLAND.

by plunging into some lake or river that happens to lie in his way, and when, at last, every attempt to escape proves abortive, he boldly faces his pursuers, and attacks the first dog or man who approaches him.

The performances of the stag-hound are remarkable. A deer, in the spring of 1822, was turned out before the Earl of Derby's hounds at Hayes Common. The chase was continued nearly four hours without a check, when, being almost run down, the animal took refuge in some outhouses near Speldhurst, in Kent, more than forty miles across the country, and having actually run more than fifty miles. Nearly twenty horses died in the field, or in consequence of the severity of the chase.

A stag was turned out at Wingfield Park, in Northumberland. The whole pack, with the exception of two hounds, was, after a long run, thrown out. The stag returned to his accustomed haunt, and, as his last effort, leaped the wall of the park, and lay down and died. One of the hounds at his heels, unable to clear the wall, fell and expired, and the other was found dead at a little distance. They had run about forty miles.

The English Blood-Hound.—A true blood-hound—and the pure blood is rare—stands about twenty-eight inches in height, muscular, compact, and strong; the forehead is broad, and the face narrow toward the muzzle; the nostrils are wide and well developed; the ears are large, pendulous, and broad at the base; the aspect is serene and sagacious; the tail is long, with an upward curve when in pursuit, at which time the hound opens with a voice deep and sonorous, that may be heard down the wind for a very long distance. The color of the true breed is almost invariably a reddish tan, darkening gradually toward the upper parts till it becomes mixed with black on the back; the lower parts, limbs, and tail being of a lighter shade, and the muzzle tawny.

Some, but such instances were not common, had a little white about them, such as a star in the face, &c. The general opinion is, that the original stock was a mixture of the deep-mouthed southern hound and the powerful old English stag-hound.

Our English ancestors, some centuries ago, discovered the extraordinary power of this breed in tracking any animal by its scent. They therefore trained it to the chase, and afterward used it to hunt down criminals. The perseverance and sagacity of these creatures in following a man on whose track they had been set, often for many miles, and even through towns and villages, and crowded thoroughfares, was indeed wonderful. In general, when they found the culprits, they would patiently keep guard over them, and not permit them to move away until their masters came up. Sometimes, however, dogs of a ferocious disposition would fall upon them and tear them in pieces. The manner in which the blood-hound pursued the robber is thus described by the poet Somerville:

"Soon the sagacious brute, his curling tail
Flourish'd in air, low bending, plies around
His busy nose, the steaming vapor snuffs
Inquisitive, nor leaves one turf untried,
Till, conscious of the recent stains, his heart
Beats quick. His snuffing nose, his active tail,
Attest his joy. Then, with deep opening mouth,
That makes the welkin tremble, he proclaims
Th' audacious felon. Foot by foot he marks
His winding way. Over the watery ford,
Dry sandy heaths, and stony barren hills,
Unerring he pursues, till at the cot
Arrived, and, seizing by his guilty throat
The caitiff vile, redeems the captive prey."

Before the union between England and Scotland, the "Border" between the two countries was the theater of constant forays, for the purpose of stealing sheep, cattle, and other property. The English and Scotch were, in fact, as great robbers as the Bedouins of the present day. In this state of things the blood-hounds became indispensable as guards. The pursuit of border forayers was called the "hot-trod." The "harried" party and his friends followed the marauders with blood-hound and bugle-horn, and if his dog could trace the scent into the opposite kingdom, he was entitled to pursue them thither. Sir Walter Scott states that the breed was kept up by the Buccleuch family on their border estates till within the eighteenth century, and records the following narrative: "A person was alive in the memory of man who remembered a blood-hound being kept at Eldinhope, in Ettrick Forest, for whose maintenance the tenant had an allowance of meal. At that time the sheep were always watched at night. Upon one occasion, when the duty had fallen upon the narrator, then a lad, he became exhausted with fatigue, and fell asleep upon a bank, near sun-rising. Suddenly he was awakened by the tread of horses, and saw five men well mounted and armed ride briskly over the edge of the hill. They stopped and looked at the flock; but the day was too far broken to admit the chance of their carrying any of them off. One of them, in spite, leaped from his horse, and coming to the shepherd, seized him by the belt he wore round his waist, and, setting his foot upon his body, pulled it till it broke, and carried it away with him. They rode off at the gallop, and the shepherd giving the alarm, the blood-hound was turned loose, and the people in the neighborhood alarmed. The marauders, however, escaped, notwithstanding a sharp pursuit. This circumstance serves to show how very long the license of the Borders continued in some degree to manifest itself."

This, perhaps, is the last instance of an attempted "Border foray" on record. The times were changed. The nobles had ceased to pride themselves on their ignorance of all the arts save the art of war, and to make it matter of thanksgiving that they knew not how to use the pen. Civilization advanced as learning was diffused, till the law of the strongest no longer prevailed against the law of the land. The blood-hound, from the nobler pursuit of heroes and knights, "minions of the moon," who swept away the cattle and goods of whole districts, marking the extent of their "raid" by all the horrors of fire and sword, sank to the tracker of the deer-stealer and petty felon, as we have related. About a century and a quarter ago, when deer-stealing was a common crime in England, the park-keepers relied upon their blood-hounds principally for detecting the thief;

and so adroit were these dogs, that when one of them was fairly laid on, the escape of the criminal was with good reason considered to be all but impossible. Even now the breed lingers about some of the great deer-parks for the purpose of guarding the game.

The Cuban Blood-Hound was a mastiff, and has been already noticed.

The African Blood-Hound.—Of this species a pair were presented to the Tower Menagerie of London by Major Denham, which he had brought from Central Africa: they were finely formed animals. This breed are used in their native country for the chase, in which they display great sagacity and power of scent.

The Otter-Hound, a mixed breed between the old English hound and the terrier, was formerly much used in England, but since the otter has nearly disappeared, it has become very rare. The terrier is used for otter-hunting in the north of Scotland.

The Beagle, probably a descendant of the old English hound and harrier, is a diminutive species of fox-hound, with a fine musical voice, and an exquisite scent, formerly much used in hunting, but now seldom employed.

The Harrier is a fox-hound, bred down to a small size, and is now chiefly used in England for hunting the hare.

The Lurcher is a cross between the greyhound and shepherd's dog. He runs mute and by scent, and is used by poachers. The keeping of one of these creatures is considered, in England, beneath the dignity of a gentleman.

We now pass from the hounds to the spaniels, an exceedingly interesting and attractive portion of the race. The spaniel is evidently the parent of the Newfoundland dog and the setter; while the retriever, the poodle, the St. Bernard, the Esquimaux, the Siberian, the Greenland, the shepherd and drover's dog, and every variety distinguished for intelligence and fidelity, have more or less of his blood in them.



KING CHARLES' AND BLENHEIM SPANIELS.

The Spaniel is probably of Spanish origin, and hence his name. The ears are large and pendent, the tail elevated, the fur of a different length in different parts of the body, but longest about the ears, under the neck, behind the thighs, and on the tail, varying in color, but most commonly white, with brown or black patches. There are many varieties of the spaniel.

The Cocker is the smallest of the land species, and is chiefly used in flushing woodcocks and pheasants in thickets and copses into which the setter, and even the springer, can scarcely enter.



THE SETTER.

"But, if the shady woods my cares employ,
In quest of feather'd game my spaniels beat,
Puzzling the entangled copse, and from the brake
Push forth the whirring pheasant."

The cocker is here very useful, although he is occasionally an exceedingly impatient animal. He is apt to whimper and babble as soon as he comes upon the scent of game, and often raises the bird before the sportsman is within reach; but when he is sufficiently broken in not to give tongue until the game rises, he is exceedingly valuable. There can scarcely be a prettier object than this little creature, full of activity, and bustling in every direction, with his tail erect, and, the moment he scents the bird, expressing his delight by the quivering of every limb, and the low, eager whimpering which the best breaking cannot always subdue. Presently the bird springs, and then he shrieks out his ecstasy, startling even the sportsman with his sharp, shrill, and strangely expressive bark.

The Springer is slower and steadier in its range than the cocker; but it is a much safer dog for the hunter, and can better stand a hard day's work. It is much esteemed by some sportsmen.

The King Charles' Spaniel, so called from the fondness of Charles II. for it—who usually

had some of them following him wherever he went—belongs likewise to the cockers. Its form and character are well preserved in one of the paintings of the unfortunate father of that monarch and his family. The ears deeply fringed and sweeping the ground, the rounder form of the forehead, the larger and moister eye, the longer and silken coat, and the clearness of the tan and white and black color, sufficiently distinguish this variety. His beauty and diminutive size have consigned him to the drawing-room or parlor. Charles the First had a breed of spaniels, very small, with the hair black and curly. The spaniel of the second Charles was of the black-and-tan kind. The King Charles' breed of the present day is materially altered for the worse. The muzzle is almost as short, and the forehead as ugly and prominent as the veriest bull-dog. The eye is increased to double its former size, and has an expression of stupidity with which the character of the dog too accurately corresponds. Still there is the long ear, and the silky coat, and the beautiful color of the hair, and the true breeds command a high price.

The Blenheim Spaniel, a breed cultivated by one of the Dukes of Marlborough, belongs to this division. From its beauty and occasional gayety, it is oftener an inhabitant of the drawing-room than the field; but it occasionally breaks out, and shows what nature designed it for.

To this division belong several other varieties, which, like the preceding, may be regarded as *Dogs of the parlor*—as the Maltese Dog, not much bigger than a weasel; the Lion Dog, nearly covered with long, wavy, silky hair, and, though exceedingly small, bearing in outline a resemblance to the lion; and the little White Dog of Cuba.

The Setter is evidently a spaniel bred down to a smaller size, and taught to mark his game by *setting* or crouching. It has great activity and strength, takes to the water when necessary, and is exceedingly attached and ready in its comprehension. It is a great favorite with many sportsmen, being often preferred to the pointer.



THE POINTER.

The Pointer is the offspring of the fox-hound and spaniel, and presents a remarkable instance of a native instinct directed to the use of man. Nothing can be more admirable than to see a pointer sweep the field in circles, and when detecting the game by his strong powers of scent, to observe him stand and point to it with his nose, till his master approaches and tells him to advance. The anecdotes of this dog's sagacity are too familiar to need repetition. There are several breeds, as the *Portuguese*, the *French*, the *Spanish*, and the *Russian*, but the *English* is by far the best as a sporting dog.

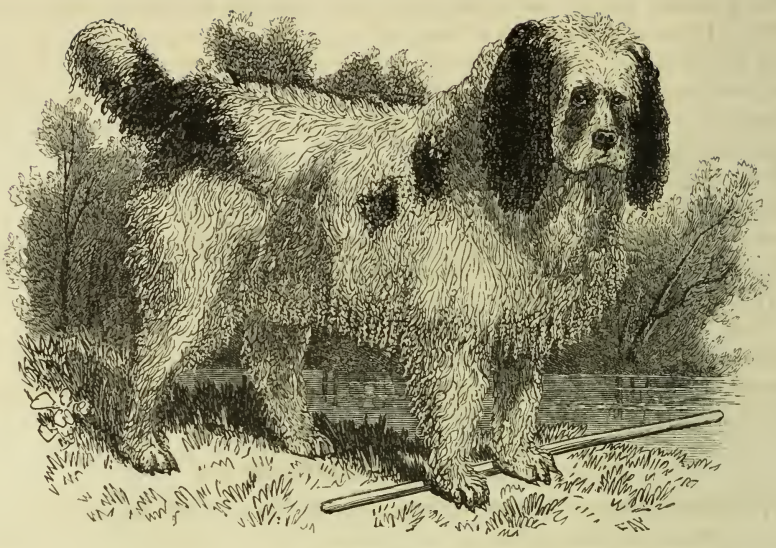


THE WATER-SPANIEL.

The WATER-SPANIEL.—Of this breed there are two varieties, a larger and smaller, both useful according to the degree of range or the work required; the smaller, however, being ordinarily preferable. In both, the head is long and the face smooth; the limbs—more developed than those of the springer—should be muscular, the carcass round, and the hair long and closely curled. Docility and affection are stamped on the countenance of this animal, and he excels every other breed in attachment to his master. In the field his work is double—first to find, when ordered so to do, and to back behind the sportsman, when the game will be more advantageously trodden up. In both he must be taught to be perfectly obedient to the voice, that he may be kept within range, and not unnecessarily disturb the birds. A more important part of his duty, however, is to find and bring the game that has dropped. To teach him to find is easy enough, for a young water-spaniel will as readily take to the water as a pointer puppy will stop; but to bring his game without tearing it is a more difficult lesson, and the most difficult of all is to make him suspend the pursuit of the wounded game while the sportsman re-loads. The water-spaniel was originally from Spain; but the pure breed has been lost, and the present dog is probably descended from the large water-dog and the English setter.

The water and land spaniels differ materially from each other. The water-spaniel, although when at his work being all that his master can desire, is, when unemployed, comparatively a slow and inactive dog; but under this sobriety of demeanor is concealed a strength and fidelity of attachment to which the more lively land-spaniel cannot always lay just claim.

Youatt tells us that he once saved a young water-spaniel from the persecution of a crowd of people who had driven it into a passage, and were pelting it with stones. "The animal had the character of being, contrary to what his species usually are, exceedingly savage; and he suffered himself to be taken up by me and carried from his foes with a kind of sullenness; but when, being out of the reach of danger, he was put down, he gazed on his deliverer, and then crouched at his feet. From that moment he attached himself to his new master with an intensity of affection scarcely conceivable—never expressed by any boisterous caresses, but by endeavoring to be in some manner in contact with him; resting his head upon his foot; lying upon some portion of his apparel, his eye intently fixed upon him, endeavoring to understand every expression of his countenance. He would follow one gentleman, and one only, to the river-side, and behave gal-



THE POODLE.

lantly and nobly there; but the moment he was dismissed, he would scamper home, gaze upon his master, and lay himself down at his feet. In one of these excursions he was shot. He crawled home, reached his master's feet, and expired in the act of licking his hand."

The Poodle.—The particular cross from which this dog descended is unknown, but the variety produced has been carefully preserved. It is probably of continental origin, and is known by its thick curly hair, concealing almost every part of the face, and giving it the appearance of a short, thick, unintelligent skull. When, however, the hair is removed, there is still the large head; but there is also the cerebral cavity more capacious than in any other dog, and the frontal sinuses fully developed, and exhibiting every indication of the intellectual class to which it belongs. It was originally a water-dog, as its long and curly hair, and its propensities in its domesticated state, prove; but from its peculiar sagacity, it is capable of being trained to almost any useful purpose, and its strong individual attachment renders it more the companion of man than a mere sporting dog; indeed, its qualities as a sporting dog are seldom recognized by its owner.

These dogs have far more courage than the water-spaniel, all the sagacity of the Newfoundland, more general talent, if the expression may be used, and more individual attachment than either of them, and without the fawning of the one, or the submissiveness of the other. The poodle seems conscious of his worth, and there is often a quiet dignity accompanying his demonstrations of friendship.

This dog, however, possesses a very peculiar kind of intelligence. It will almost perform the common offices of a servant: it will ring the bell and open the door. Mr. Wilkie, of Ladythorn, in Northumberland, had a poodle which he had instructed to go through all the apparent agonies of dying. He would fall on one side, stretch himself out, and move his hind-legs as if he were in great pain; he would next simulate the convulsive throbs of departing life, and then stretch out his limbs, and thus seem as if he had expired. In this situation he would remain motionless, until he had his master's command to rise.

A poodle occupies an interesting place in the history of the Peninsular war. He belonged to a French officer, who was killed at the battle of Castella. The French were compelled to retreat before they could bury their dead, and the soldiers wished to carry with them this regimental favorite, but he would not be forced from the corpse of his master. Some soldiers afterward traversing the field of battle, one of them discovered the cross of the Legion of Honor on the breast of the fallen officer, and stooped to take it away, when the dog flew savagely at him, and would not quit his hold, until the bayonet of another soldier laid him lifeless.

The Barbet is a small poodle, the production of some unknown and disadvantageous cross with the true poodle. It has all the sagacity of the poodle, and will perform even more than his tricks. It is always in action, always fidgety, generally incapable of much affection, but inheriting much self-love and occasional ill-temper, unmanageable by any one but its owner, eaten up with red mange, and frequently a nuisance to its master, and a torment to every one else. It is, however, very intelligent, and truly attached to its owner.

The barbet possesses more sagacity than most other dogs, but it is sagacity of a particular kind, and frequently connected with various amusing tricks. Mr. Jesse, in his "Gleanings in Natural History," gives a singular illustration of this. A friend of his had a barbet that was not always under proper command. In order to keep him in better order, he purchased a small whip, with which he corrected him once or twice during a walk. On his return, the whip was put on a table in the hall, but the next morning it was missing. It was soon afterward found concealed in an out-building, and again made use of in correcting the dog. Once more it would have been lost, but on watching the dog, who was suspected of having stolen it, he was seen to take it from the hall table in order to hide it once more.

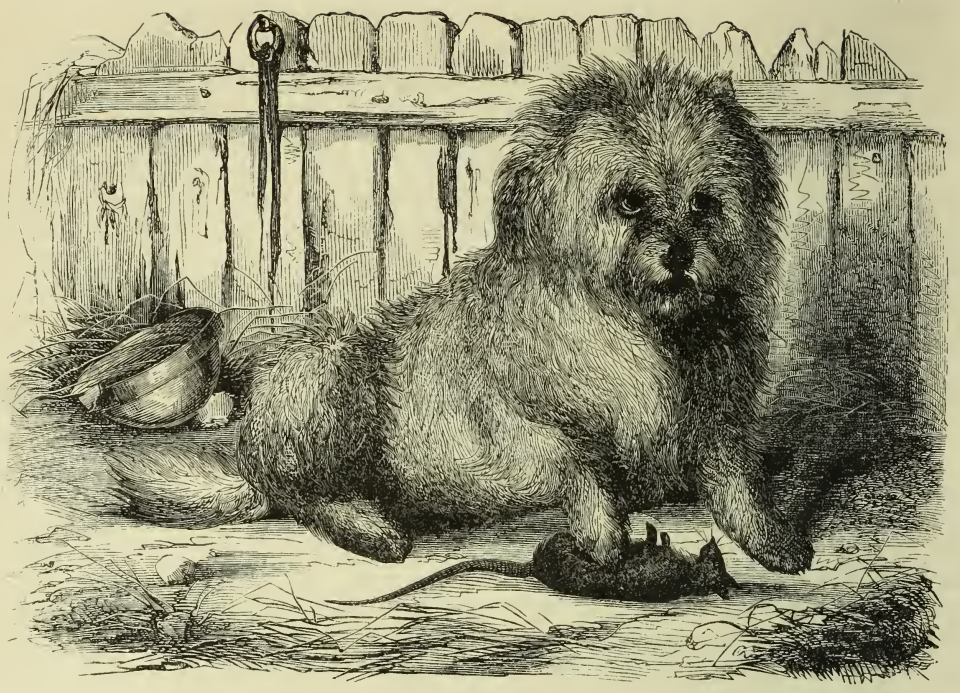
DIVISION V.—CUR-DOGS—MIXED BREEDS.

This division embraces several remarkable varieties, generally below the middling size, with large eyes, and a large head, and possessing great activity and intelligence. The French matin, already described, approaches this breed, but it seems to have become a distinct, permanent race. At the head of the division, therefore, we must place the Cur-Dog proper. This has long had a bad name as a bully and a coward, and certainly his habit of barking at every thing that passes, renders him often a very annoying animal. He is, however, in a manner necessary to the laborer; he is a faithful defender of his humble dwelling; no bribe can seduce him from his duty; and he is likewise a useful and an effectual guard over the clothes and scanty provisions of his master, who may be working in some distant part of the field. All day long he will lie upon his clothes, seemingly asleep, but giving immediate warning of the approach of a supposed marauder. He has a propensity to fly at every horse and every strange dog, and is thus often regarded as a nuisance.

Mr. Hogg, however, in a curious parallel between the sheep-dog and the cur, gives him a good character. "An exceedingly good sheep-dog," he says, "attends to nothing but the particular branch of business to which he is bred. His whole capacity is exerted and exhausted in it, and he is of little avail in miscellaneous matters; whereas a very indifferent cur, bred about the house, and accustomed to assist in every thing, will often put the more noble breed to disgrace in these little services. If some one calls out that the cows are in the corn, or the hens in the garden, the house colley needs no other hint, but runs and turns them out. The shepherd's dog knows not what is astir, and, if he is called out in a hurry for such work, all that he will do is to run to the hill, or rear himself on his haunches to see that no sheep are running away. A well-bred sheep-dog, if coming hungry from the hills, and getting into a milk-house, would likely think of nothing else than filling his belly with the cream. Not so his initiated brother: he is bred at home to far higher principles of honor. I have known such lie night and day among from ten to twenty pails full of milk, and never once break the cream of one of them with the tip of his tongue, nor would he suffer cat, rat, or any other creature to touch it. While, therefore, the cur is a nuisance, he is very useful in his way, and we would further plead for him, that he possesses a great deal of the sagacity and all the fidelity of the choicest breed of dogs."

The Terriers are of such variety as to render it difficult to describe them. We shall only mention the principal breeds.

The English Terrier has the forehead convex, the eye prominent, the muzzle pointed, the tail thin and arched, the fur short, the ears of moderate size, half erect, and usually of a deep-black color, with a yellow spot over the eyes. The coat may be either smooth or rough. The smooth-haired ones are more delicate in appearance, and are somewhat more exposed to injury or accident; but in courage, sagacity, and strength, there is very little difference, if the dogs are equally well bred. The rough terrier possibly obtained his shaggy coat from the cur, and the smooth terrier may derive his from the hound.



SCOTCH TERRIER.

The Scotch Terrier is of three varieties. The common Scotch terrier is twelve or thirteen inches high; his body muscular and compact, with considerable breadth across the loins, and the legs shorter and stouter than those of the English terriers. The head is large in proportion to the size of the body, the muzzle small and pointed, with strong marks of intelligence in the countenance, warm attachment to its master, and the evident devotion of every power to the fulfillment of his wishes. The hair is long and tough, and extending over the whole of the frame. In color it is black or fawn: the white, yellow, or pied are always deficient in purity of blood. Another species has nearly the same conformation, but is covered with longer, more curly, and stouter hair—the legs being apparently, but not actually, shorter. A third species of terrier is of a considerably larger bulk, and three or four inches taller than either of the others. Its hair is shorter than that of the other breeds, and is hard and wiry. Mrs. Lee, in her clever book of Anecdotes of Animals, gives us the following:

"The most ancient of this influential, if not respectable, tribe of dogs—indeed the most ancient dog of Great Britain—is the Scotch terrier, brought to us, probably, from the northwest of Europe by our primitive inhabitants. There are two varieties of indigenous terriers—the one, smooth, usually white or black in color, with tan spots, sharp muzzle, bright and lively eyes, pointed or slightly turned-down ears, and tail carried high. It is, however, supposed that the Scottish race, with a shorter and fuller muzzle, stouter limbs, hard, shaggy fur, sometimes white in color, but more often sandy or ochry, is the oldest and most genuine breed. One of these clever and excellent beasts, named Peter, lived with my mother for some years, and during the whole of that time evinced the greatest sagacity and attachment. He constantly understood the conversation, provided it related to cats, rats, or himself; and often when we spoke of him casually, without even knowing he was in the room, or calling him by his name, he has laid his head on our knees and wagged his tail, as much as to say, 'I understand.' He was a most inveterate enemy to all rats, mice, and cats, nipping them in the back of the neck, and throwing them over his head, at the rate of one in a minute. Before he came into our family, he won a wager that he would kill twelve rats in twelve minutes. The second rat fastened on his lip, and hung there while he dispatched the other ten, and then, within the given time, he finished that also.

"For the last three months of my mother's existence, Peter was almost always on her bed, night and day; and during the final four weeks, when death was daily expected, he was sad and dull, which was attributed to the change in the habits of the family. Forty-eight hours before all was over, Peter crept into a corner under the bed, which had always been his place of refuge when in trouble, and we with difficulty prevailed on him to quit it, even when his mistress wished to see and say farewell to him. On that occasion he hung his head, and appeared to be so miserable, that apprehensions of malady on his part were entertained. He returned to his corner, and was not thought of for some time. At length all was quiet in the room, and I was about to leave it, when I recollected Peter. He was with difficulty prevailed on to leave his corner, where he lay curled up and trembling. I lifted him up to take a last look of his beloved mistress, but he laid his head on my shoulder, and was so much distressed that I carried him away immediately. On the following day he accompanied me up stairs, and when I passed my mother's door, he looked up in my face, as much as to say, 'Are you going in there?' but I replied 'No!' and he never again asked for entrance."

A favorite terrier was in the habit of accompanying his master, who was a clergyman, to church, where he was so perfectly quiet that few persons knew of his presence. On one occasion he went to a funeral, and when the procession left the church, accompanied his master to the side of the grave, where he mingled with the attendants. The parties remained for some little time looking at the coffin after it was lowered, and the clergyman slipped away, unobserved even by his dog. An hour after, as he sat at dinner with his friends, his sexton requested to speak with him. He was admitted into the room, when he said it was impossible to close the grave, and that he did not know what to do. "Why?" asked the gentleman. "Because, sir, your terrier stands there, and flies so fiercely at us whenever we attempt to throw a spadeful in, that we dare not go on." One of the house-servants was sent to the churchyard, and there saw the dog in a perfect fury, defending the grave. He refused to come at his call, so by main force he removed him, and carried him to the drawing-room. There, the moment he saw his master, his transport of joy equaled his former fury; and it is supposed that, not seeing his master go away, and missing him, he fancied he was in the grave, and thus strove to protect him from injury.

A terrier, known to Professor Owen, was taught to play at hide-and-seek with his master, who summoned him by saying, "Let us have a game!" upon which the dog immediately hid his eyes between his paws, in the most honorable manner, and when the gentleman had placed a sixpence, or a piece of cake, in a most improbable place, he started up and invariably found it. His powers were equaled by what was called a fox-terrier, named Fop, who would hide his eyes, and suffer those at play with him to conceal themselves before he looked up. If his playfellow hid himself behind a window-curtain, Fop would, for a certain time, carefully pass that curtain, and look behind all the others, behind doors, etc., and when he thought he had looked long enough, seize the concealing curtain and drag it aside in triumph. The drollest thing, however, was to see him take his turn of hiding. He would get under a chair, and fancy that he was not seen. Of course those at play with him pretended not to see him, and it was most amusing to witness his agitation as they passed. When he was ill, he had been cured by some homœopathic globules, and ever after, if any thing were the matter with him, he would stand near the medicine-box, and hold his mouth open.

A black-and-tan terrier, belonging to a linen-draper in Swindon, as soon as the shop was opened in the morning, was in the habit of going to the post-office with his master. The letter-bag was put into his mouth, and he carried it home. One morning he took it into his head to precede his master, and go alone. The postmaster, on seeing him, felt so certain his owner was at the door, that he delivered the bag to him, with which he ran home, while his master was seeking him. From that time it became his regular duty to fetch the letters daily.

Sir Walter Scott tells us of the remarkable comprehension of human language evinced by his bull-terrier, called Camp. He understood so many words, that Sir Walter felt convinced an intercourse with dumb animals might be enlarged. Camp once bit the baker, for which Sir Walter beat him, and, at the same time, explained the enormity of the offense; after which, to the last moment of his life, he never heard the least allusion to the story, in whatever voice or

tone it might be mentioned, without getting up and retiring into the darkest corner of the room, with great appearance of distress. Then, if it were said that the baker had been well paid, or that the baker was not hurt after all, Camp came forward, capered, barked, and rejoiced. When he was unable, toward the end of his life, to attend his master in his rides, he watched for his return, and the servant used to tell him Sir Walter was coming down the hill, or through the moor. Camp never mistook him, although he did not use any gesture, but either went out at the front to ascend the hills, or at the back to get at the moor side.

The use of terriers is various. In this country they are chiefly employed for destroying rats, in which they display prodigious skill and activity. The black-and-tan variety is a favorite in the livery stables.

To this fifth division belong the pariahs of India, and generally the vagabond street-dogs of Asia and Africa, which we have already described. We must also mention under this head the Poe, found in some of the islands in the Pacific; the Kararahe, the native breed of New Zealand—a small species used as a watch-dog—probably the descendants of animals left on the island three centuries ago by Spanish navigators; and the semi-domestic dogs of the Indians of Patagonia and Terra del Fuego. Here also we must place the Dingo of New Holland.



THE DINGO.

This remarkable variety has the head elongated, the forehead flat, and the ears short and erect, or with a slight direction forward. The body is thickly covered with hair of two kinds,—the one woolly and gray, the other silky and of a deep yellow or fawn color. The limbs are muscular, and, in their form and proportions, resemble those of the common shepherd's dog. He is very active and courageous. When running, the head is lifted up, and the tail is carried horizontally. Like other wild dogs, he does not generally bark, but whines and growls. He does, however, occasionally bark, and has the same kind of snarling voice which the larger dogs commonly have. The specimens of the dingo that have been brought to Europe have usually been of a savage and intractable disposition. There have been several of these in the Zoological Gardens of London. Some of them were inmates of that establishment for a dozen years, but not an individual acquired the bark of the other dogs by which they were surrounded. When a stranger made his appearance, or when the hour of feeding arrived, the howl of the Australasian was the first sound that was heard, and it was louder than all the rest. If some of them throw off a portion of their native ferocity, others retain it undiminished. A bitch and two of her whelps,

nearly half grown—a male and a female—had inhabited the same cage from the time that the young ones were born. Some cause of quarrel occurred on a certain night, and the two bitches fell upon the dog and destroyed him. There was not a limb left whole. Even in their native country all attempts to domesticate them perfectly, have failed, for they never lose an opportunity to devour the poultry or attack the sheep. One that was brought to England broke his chain—scoured the surrounding country—and, before dawn, had destroyed several sheep; and another attacked, and would have destroyed, an ass, if he had not been prevented. These animals were formerly numerous in New Holland, but they are now comparatively rare.

A curious instance of the effect of domestication in producing variation in color has lately been exhibited in a very striking and interesting manner in the menagerie of the Zoological Society by a bitch of this variety. She had a litter of puppies, the sire of which was also of her own breed. Both of them had been taken in the wild state, but were of the uniform reddish-brown color which belongs to the race, and the mother had never bred before; but the young, bred in confinement and in a half-domesticated state, were all of them more or less spotted.

DIVISION VI.—THE MASTIFF AND BULL-DOG.

The ancients divided dogs into three kinds: the *Celeres*, or swift dogs, which hunted by sight, of which the greyhounds are the types; the *Sagaces*, or intelligent dogs, of which the spaniels are the types; and the *Pugnaces*, or fighting dogs, of which the mastiffs and bull-dogs are the repre-



THE MASTIFF.

sentatives. Of this latter kind, there was a variety from Epirus, probably the same as the modern Albanian dog, which had great fame; but, after the discovery of Britain, these were pitted against a native variety of that island—doubtless the progenitors of the modern mastiff or the bull-dog—and completely beaten. The British *pugnaces* have maintained their ascendency from that day to this. The climate, indeed, seems favorable to the development of the fighting faculty, as the history of John Bull and his bull-dog alike testify.

The Mastiff is doubtless an original breed of the British islands, and there it has its completest

development. We may say, without offense, that he is a good deal of an Englishman in his air and manner,—of full habit, grave and somewhat sullen aspect, and a deep, sonorous voice. He seems aware of his imposing presence, and takes care that it shall make its full impression. He acknowledges no superior, and is a little imperious toward his equals—especially those who question his claims to superiority—but is magnanimous toward his inferiors. He is fierce in his enmities, but warm and faithful to the death in his friendships. He understands his duties, and scrupulously performs them. In the course of the night he frequently makes an excursion, and carefully examines the premises he is appointed to guard and defend; and, on the slightest suspicion, makes the welkin ring with his warning voice. He is as true to the cottager as the prince, and woe be to whoever—when this dog is on duty—ventures to injure the person or property of the one or the other. This breed is common in our own country, especially in the New England villages; and, although often debased by impure blood, is still a faithful and favorite watch-dog.



THE THIBET MASTIFF.

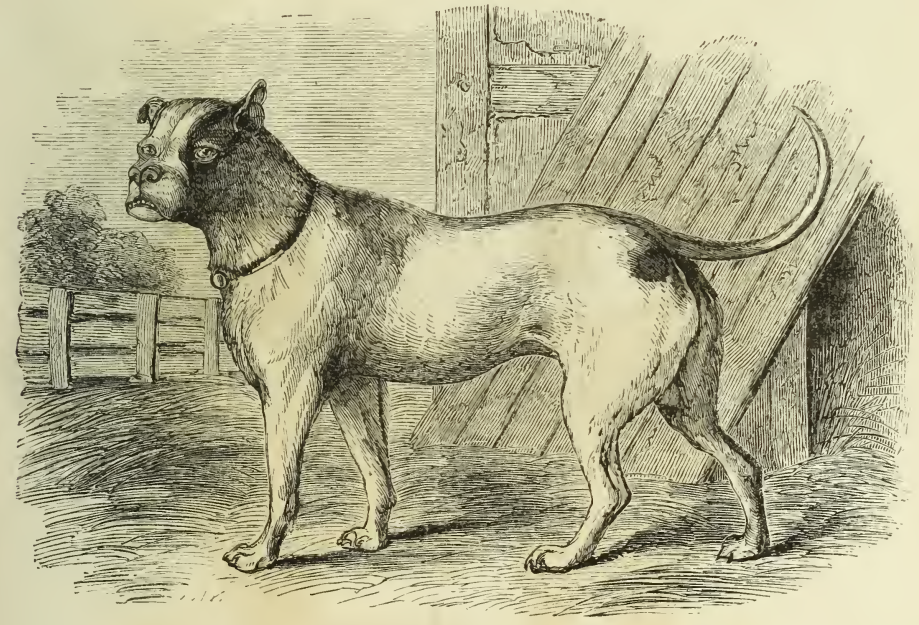
The Thibet Mastiff is of immense size, and of a deep-black color, slightly clouded on the sides, his feet and a place over the eyes being of a tawny hue. He is bred in the table-land of the Himalayah Mountains bordering on Thibet. The Bhoteas, by whom many of them are carefully reared, come down to the low countries at certain seasons of the year to sell their borax and musk. The women remain at home, and they and the flocks are most sedulously guarded by these dogs. They are the defenders of almost every considerable mansion in Thibet.

To this division belong the Dog of Sumatra, the Dog of Cuba, a breed inferior to the Cuban mastiff, already described, the Little Danish Dog, and a great number of mongrels, of no great worth, which pass by different names in different countries.

The Bull-Dog has a round, thick head, a turned-up nose, and thick and pendulous lips. He is

of moderate size, but of great strength and courage. In general he makes a silent though ferocious attack, and the persisting powers of his teeth and jaws enable him to keep his hold against any but the greatest efforts, so that the utmost mischief is likely to ensue as well to the innocent visitor of his domicile as to the malicious intruder. He is scarcely capable of any education, and is fitted for nothing but ferocity and combat.

The name of this dog, which is of English origin, is derived from his being employed in England and other countries, until a few years ago, in baiting the bull. This was practiced by the low and dissolute in many parts of the United Kingdom. Dogs were bred and trained for the purpose; and while many of them were injured or destroyed, the head of the bull was lacerated in the most barbarous manner. Nothing can exceed the fury with which the bull-dog rushed on his foe, and the obstinacy with which he maintained his hold. He fastened upon the lip, the muzzle, or the eye, and there he hung, in spite of every effort of the bull to free himself from his antagonist.



THE BULL-DOG.

Bull-dogs are not so numerous as they were a few years ago; and every kind-hearted person will rejoice to hear that bull-baiting is now put down by legal authority in every part of Great Britain. A few of them are kept in this country, but they are neither useful nor agreeable.

The Bull-Terrier.—This dog is a cross between the bull-dog and the terrier, and is generally superior, both in appearance and value, to either of its progenitors. A second cross considerably lessens the underhanging of the lower jaw, and a third entirely removes it, retaining the spirit and determination of the animal. It forms a steadier friendship than either of them, and the principal objection to it is its love of wanton mischief, and the dangerous irascibility which it occasionally exhibits.

The Pug-Dog is a small variety, which has something of the power of the bull-terrier. It combines a ludicrous importance and pretense with littleness of form and pettishness of character. It is noisy and snappish, but capable of strong attachment. The *French Pug* is a docile creature, and is taught many ingenious tricks.



The Wolf, *Canis lupus*, is always and everywhere an untamed, ferocious animal, yet, strange to say, in its structure and physiological characteristics, it is very similar to the dog. On account of its superior strength and energy, and its being supposed to be the progenitor of the dog, it is placed by some naturalists at the head of the *Canidæ*. It consists of many varieties, differing somewhat in size and vigor, but all ravenous, daring, and destructive. Being spread over a considerable portion of the world, and coming frequently in collision with man, its history makes a prominent figure in the annals of the brute creation. It is associated with the early settlements of most countries as a dangerous enemy of man, and is hence woven into the tales, ballads, legends, adventures, and fables which embellish the early literature of most nations. Adventures with wolves furnish some of the most exciting tales of hunters in Europe as well as America. The frightful story of "Little Red Riding-Hood," which has peopled the imaginations of so many children with mischievous terrors, is a familiar example of the impressions which these creatures have made on the popular mind.

The *Common Wolf* of Europe and America is of the size of a large dog; its usual color is a yellowish gray: the hair is strong and harsh, and longest around the neck, shoulders, and haunches. The muzzle is black, the upper lip and chin white, the eyes oblique, tail bushy, but carried low: height of the shoulder twenty-seven to twenty-nine inches. This is the most common aspect of the species, but it varies in different countries. In the high northern countries of Europe and America, owing to the effect of climate, it sometimes becomes white, or nearly so. One of the varieties is much darker, and is called the *Black Wolf*, as well in Europe as America. In different countries it varies not only in color, but in other characteristics. The French wolves are generally browner and smaller than those of Germany; the Russian race is longer, and appears more bulky and formidable from the great quantity of long coarse hair on the cheeks,



FRENCH WOLVES.

gullet, and neck; their eyes are very small, and their whole aspect peculiarly savage and sinister. The Swedish and Norwegian wolves are similar to the Russian in form, but appear heavier and deeper in the shoulder, lighter in color, and in winter, totally white. The Alpine wolves are brownish gray, and smaller than the French; those of Italy, and to the eastward as far as Turkey, are fulvous. Toward the Arctic regions of our own continent, they are nearly white; further south, some are brown and some black. In Great Britain, these fierce animals were once numerous and destructive; the power of several kings was exerted in vain to extirpate them. They are, however, now altogether extinct in the Three Kingdoms. In the mountainous parts of France, Spain, Germany, Italy, Sweden, Norway, and Russia, they are still numerous, and in some districts they are often formidable to the inhabitants.

In Asia there are several varieties, as the Landgah, of Nepaul; the Beriah, of India; the *C. hodophilax*, of Japan; and the Black Derboun, of the mountains of Arabia and Syria. These present peculiarities which have led some naturalists to regard them as of distinct species.

Sir John Richardson enumerates the following varieties among the North American wolves: the Common Gray Wolf, *Canis lupus griseus*, the *Mahaygan* of the Cree Indians, and the *Amarok* of the Esquimaux; the White Wolf, *C. l. albus;* the Pied Wolf, *C. l. sticte;* the Dusky or Clouded Wolf, *C. l. nubilus;* the Black American Wolf, *C. l. ater;* and the Prairie Wolf, the *Lupus latrans* of Say. To these we may add the Red Texan Wolf, *C. l. rufus.*

As we regard the various kinds of dogs of one species, so we consider the wolves as of one species. They differ in size, form, and color, but, as we have said, all are savage, fierce, and predaceous. The first named, the *Gray Wolf*, identical with the common wolf of Europe, was spread over our country, in its early days, from Maine to Georgia. The first settlers of Boston were obliged to fence in their cattle at night to protect them from the wolves. An old author says: "The wolf of Carolina is the dog of the woods. It is neither so large nor so fierce as the European wolf. They go in great droves in the night to hunt deer, which they do as well as the best pack of hounds: nay, one of these will hunt down a deer. They are often so poor that they can hardly run. When they catch no prey, they go to a swamp and fill their belly full of mud; if afterward they chance to get any thing of flesh, they will disgorge the mud and eat the other. When they hunt in the night, and there are a great many together, they make the most hideous and frightful noise that ever was heard. The fur makes good muffs. The skin, dressed to a parchment, makes the best drum-heads, and if tanned, makes the best sort of shoes for the summer-countries." We hardly need say, that with much truth this account mingles some absurd fiction.

Although this animal has disappeared from the settled parts of our continent, it is still common

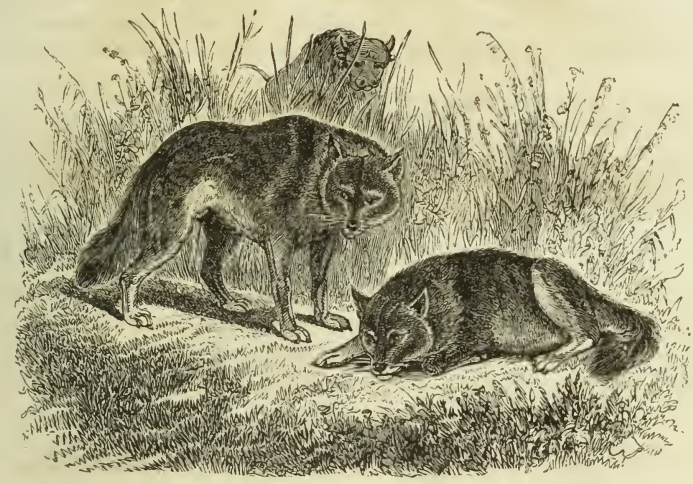


AMERICAN WOLF.

throughout the wild northern regions, being more or less abundant in different districts. "Their foot-marks," says Richardson, "may be seen by the side of every stream, and a traveler can rarely pass a night in these wilds without hearing them howling around him. They are very numerous on the sandy plains which, lying to the eastward of the Rocky Mountains, extend from the sources of the Peace and Saskatchewan rivers toward the Missouri. There bands of them hang on the skirts of the bison herds, and prey upon the sick and straggling calves. They do not, under ordinary circumstances, venture to attack the full-grown animal, for the hunters informed me that they often see wolves walking through a herd of bulls without exciting the least alarm; and the marksmen, when they crawl toward a buffalo for the purpose of shooting it, occasionally wear a cap with two ears, in imitation of the head of a wolf, knowing from experience that they will be suffered to approach nearer in that guise. On the Barren Grounds through which the Coppermine River flows, I had more than once an opportunity of seeing a single wolf in close pursuit of a reindeer; and I witnessed a chase on Point Lake when covered with ice, which terminated in a fine buck reindeer being overtaken by a large white wolf, and disabled by a bite in the flank. An Indian, who was concealed on the borders of the lake, ran in and cut the deer's throat with his knife: the wolf at once relinquished his prey and sneaked off. In the chase, the poor deer urged its flight by great bounds, which for a time exceeded the speed of the wolf; but it stopped so frequently to gaze on its relentless enemy, that the latter, toiling on at a 'long gallop,' with its tongue lolling out of its mouth, gradually came up. After each hasty look the deer redoubled its efforts to escape; but, either exhausted by fatigue or enervated by fear, it became, just before it was overtaken, scarcely able to keep its feet."

The same author observes that the wolves destroy many foxes, which they easily run down if they perceive them on a plain at any distance from their hiding-places; and he relates that in January, 1827, a wolf was seen to catch an Arctic fox within sight of Fort Franklin, and although immediately pursued by hunters on snow-shoes, it bore off its prey in its mouth without any apparent diminution of its speed. The same wolf continued for some days to prowl in the vicinity of the fort, and even stole fish from a sledge which two dogs were accustomed to draw home from the nets without a driver. As this kind of depredation could not be allowed to go on, the wolf was waylaid and killed. He further states, that the buffalo-hunters would be unable to preserve the game they kill, from the wolves, if the latter were not as timid as they are rapacious. The simple precaution of tying a handkerchief to a branch, or of blowing up a bladder and hanging it to wave in the wind, is sufficient to keep herds of wolves at a distance. At times, however, he says that they are impelled by hunger to be more venturous, and that they have been known to steal provisions from under a man's head in the night, and to come into a traveler's bivouac and carry off some of his dogs. "During our residence at Cumberland House in 1820," contin-

ues Sir John, "a wolf, which had been prowling round the fort, and was wounded by a musket-ball and driven off, returned after it became dark, while the blood was still flowing from its wound, and carried off a dog from among fifty others, that howled piteously, but had not courage to unite in an attack on their enemy. I was told of a poor Indian woman who was strangled by a wolf, while her husband, who saw the attack, was hastening to her assistance; but this was the only instance of their attacking human life that came to my knowledge. As the winter advances and the snow becomes deep, the wolves, being no longer able to hunt with success, suffer from hunger, and in severe seasons many die."



PRAIRIE WOLVES.

The Prairie Wolf is a well-known variety, of a smaller size, with a sharp pointed nose, and a fox-like expression. Its general color is a reddish brown. It has received various names, as the *Barking Wolf*, from its barking somewhat like a dog, the *Burrowing Dog*, and the *Cased Wolf*. Its northern range is about the 55th degree of latitude, and thence southward to Mexico. It is abundant in Texas. It associates in greater numbers than the gray wolf of the same districts: it hunts in packs, and brings forth its young in burrows on the open plain, remote from the woods. On the banks of the Saskatchewan these animals start forth from the earth in great numbers on hearing the report of a gun, and gather round the hunter expectant of the offal of the animal which he has slain. They are much more fleet than the common wolves. Sir John Richardson was informed by an experienced hunter who had resided for forty years on the Saskatchewan, that the only animal on the plains which he could not overtake, when mounted on a good horse, was the prong-horned antelope, and that the prairie wolf was the next in speed. These animals live on birds, small quadrupeds, and, when urged by necessity, on the carcasses of buffaloes and other animals. When taken young they can be tamed, and have some of the qualities of a dog, but neither his intelligence nor his fidelity.

The Red Texan Wolf resembles the gray wolf in size and form, but has a more foxy countenance; in its habits, also, it resembles the gray variety. It is common from Arkansas to Mexico, and perhaps further south. In color it is of a reddish brown, but there is a considerable diversity among the different varieties.

It may be remarked, generally, that the gray, white, and black wolves are widely distributed over North America, all being found more or less frequently, from the Arctic regions to the Gulf of Mexico. The prairie wolf seems nearly confined to the plains east of the Rocky Mountains; the red Texan wolf is exclusively southern in its distribution.

The Cayotl or Caygotle of Mexico appears to be a small variety of wolf, of a whitish-gray color, and of a less savage character than is common to the tribe. Mr. Ryan tells us that he was followed by one of them, and every evening when he encamped, the wolf squatted himself down,

and helped himself whenever he could. Something, however, was generally left for him; and he became so tame, that he stopped when the party stopped, and when any thing was killed, walked round and round, licking his jaws in expectation of his share. No one ever molested him, and therefore he continued quite harmless.

The Aguara, *C. l. jubatus*, of South America, is called the Red Wolf by some authors. It is a great plunderer, but flies from man. It seems confined to the marshy districts of Paraguay, along the Rio de la Plata.

From the narratives which are furnished respecting wolves, it would appear that the European varieties are much more savage than our own. We are told that a woman, in Russia, accompanied by three of her children, was one day in a sledge, when they were pursued by a number of wolves. She put the horse to a gallop, and drove toward her home with the utmost speed. She



A WOMAN AND HER CHILDREN PURSUED BY WOLVES.

was not far from it; but the ferocious animals gained upon her, and were upon the point of rushing on to the sledge. For the preservation of her own life, and that of the remaining children, the poor frantic creature cast one of them to her blood-thirsty pursuers. This stopped their career for a moment; but, after devouring the poor child, they renewed the pursuit, and a second time came up with the vehicle. The mother, driven to desperation, resorted to the same horrible expedient, and threw another of her offspring to the ferocious assailants. The third child was also sacrificed in the same way, and soon after, the wretched being reached her home in safety. Here she related what had happened, and endeavored to palliate her own conduct, by describing the dreadful alternative to which she had been reduced. A peasant, however, who was among the bystanders, and heard the recital, took up an axe, and with one blow cleft her skull in two, saying, at the same time, that "a mother who could thus sacrifice her children for the preservation of her own life, was no longer fit to live." The man was committed to prison, but the emperor subsequently granted him a pardon.

The following story is less tragic, but not less exciting. In Hungary, a man and a boy, on a sledge, were proceeding, just at dusk, toward a village. As they emerged from a wood, the owner, who was seated behind with his back to the horses, saw a wolf rush out of the angle of the forest, and give chase to the sledge at the top of his speed. The man shouted to the boy who was driving, "Farkas! farkas!"—A wolf! a wolf!—"Itze het! itze het!"—Drive on! and the lad, looking round in terror, beheld the animal just clearing the gripe which ran along the road they had passed. Quick as lightning, with shout and whip, and with all his might, he urged the horses to gain the village. Away they flew at their fullest stretch, as if sensible of the danger behind them. The man turned his seat, and urged the boy still more energetically to lash the horses to their very utmost speed. He did not need any further incentive, but pushed on the nags with frantic exertion. The sledge flew over the slippery road with fearful speed; but the wolf urged more his utmost pace, and gained fast upon it. The village was distant about two hundred yards below the brow of the hill; nothing but the wildest speed could save them, and the man felt that the wolf would inevitably spring upon them before they could get to the bottom. Both shouted wildly as they pursued their impetuous career, the sledge swerving frightfully from one side of the road to the other, and threatening every moment to turn over. The man then drew his thick bunda—sheep-skin—over his head; he looked behind and saw the fierce, panting beast within a few yards of him; he thought he felt his hot breath in his own face; he ensconced his head again in his bunda, and, in another moment, the wolf sprang upon his back, and gripped into the thick sheep-skin that covered his neck.

With admirable presence of mind the bold-hearted peasant now threw up both his hands, and grasping the wolf's head and neck with all his strength, hugged him with an iron clutch to his shoulders. "Itze het!" shouted the brave fellow, and holding his enemy in a death grip, they swept into the village, dragging the fierce brute after them, in spite of his frantic efforts to disengage himself. The shouts of the boy and man, with the mad speed and noise of the horses, brought the villagers out to see what was the matter. "Farkas! farkas!" shouted both, and the peasants immediately seeing their perilous position, gave chase with their axes, calling out to the man to hold on bravely. At length the boy succeeded in slackening the speed of the animals, the sledge stopped, and the peasants, rushing on, dispatched the ferocious creature upon the man's back, whose arms were so stiffened with the immense muscular exertion he had so long maintained, that he could hardly loosen them from the neck of the dead wolf.



THE JACKAL.

The Jackal has the dental formula of the dog. The pupil of the eye is round; the color yellowish gray above, whitish below; thighs and legs yellow; ears ruddy; muzzle very pointed;

tail reaching hardly to the heel. The colors sometimes vary; the size is about two thirds that of the wolf.

Its habits are gregarious; it hunts in packs, and is the pest of those countries where it is found. In their huntings the jackals will frequently attack the larger quadrupeds, but the smaller animals and the poultry are their most frequent prey. Their cry is very peculiar and piercing. Captain Beechey notices it as having something rather appalling when heard for the first time at night; and he remarks, that as they usually come in packs, the first shriek which is uttered is always the signal for a general chorus. "We hardly know," continues the captain, "a sound which partakes less of harmony than that which is at present in question; and, indeed, the sudden burst of the answering long-protracted scream, succeeding immediately to the opening note, is scarcely less impressive than the roll of the thunder-clap immediately after a flash of lightning. The effect of this music is very much increased when the first note is heard in the distance—a circumstance which often occurs—and the answering yell bursts out from several points at once, within a few yards or feet of the place where the auditors are sleeping." These animals burrow in the earth, and are said to devour the dead on the battle-field, and to scratch away the earth from the shallow graves in order to feed on the corpses. Jackals are also noted for a very disagreeable odor. The story of the jackal being the lion's provider, may have arisen from the notion that the yell of the pack gives notice to the lion that prey is on foot, or from the jackal's being seen to feed on the remnants of the lion's quarry.

Some authors are of opinion that the three hundred foxes between whose tails Samson is said to have put fire-brands in order that they might set fire to the crops of the Philistines—Judges, xv. 4, 5—were jackals. Many of the modern Oriental names for the last-mentioned animals—*Chical* of the Turks, *Sciagal*, *Sciugal*, *Sciachal*, or *Shacal* of the Persians—come very near to the Hebrew word "Shual." Hasselquist, speaking of "*Canis aureus*, the Jackcall, Chical of the Turks," says: "There are greater numbers of this species of fox to be met with than the former—*Canis vulpes*—particularly near Jaffa, about Gaza, and in Galilee. I leave others to determine which of these is the fox of Samson."

Fossil Dogs and Wolves.—The fossil remains of dogs and wolves have been found in various parts of Europe, and especially in the bone-caves of Great Britain. Gervais says, however, that no bones known to be those of the dog have been discovered of a date anterior to the age of man, and to that of the ox, horse, and other animals which came into existence with man.

Genus FOX: *Vulpes*.—The fox agrees with the dog in dental formula and general osteological character, and hence he has been classified with the genus *Canis*. But the lengthened and sharp-pointed muzzle, the round head, the form of the pupil of the eye,—which is linear and vertical by day, though it becomes nearly round in the darkness,—the long body, short limbs, and elongated, thick, and bushy brush, constitute differences which separate the former from the latter, and have led naturalists to place the fox in a distinct genus.

The Common Fox of Europe, *V. vulgaris*, although distinguished by some variations of color, is generally of the same complexion as our American red fox. It is the most remarkable species, and is that which has long figured in history. It is found in most parts of Europe, and in Asia and Africa. It is voracious, swift of foot, and of great strength for its size. Its prominent characteristic, however, and that which has been noted in all ages and countries, is its cunning. "As cunning as a fox" is a saying in many languages.

In the earliest fables,—those of Lokman the Arabian, from which Esop is supposed to have borrowed,—the fox figures in the character of the flatterer, and from that day to this, "Reynard the fox" has been the chief hero of the proverbialists of all countries.

We have already had occasion to notice the intense interest with which the chase of the fox is regarded in England. This is the only sport there called "hunting," the pursuit of other animals being expressed by various terms. The chase of the hare is "coursing;" of birds, "shooting," &c. The red fox, the only species in that country, is said to be superior to the common red fox in America, in his capacity to sustain a long chase; and, living in a thickly settled country, he is a more wily beast than his American brother. The following account of the fox in England, from the "London Sporting Magazine," will be read with interest:

"Though the cunning of the fox is proverbial, this is not the only remarkable quality by which he is characterized; he is also bold and resolute, particularly when a supply of food has to be provided for a litter of cubs. He possesses, besides, those enduring qualities that will carry him through a chase of some forty or fifty miles, right ahead, across every description of country—low grounds and commons, fallows and pastures, woods and plantations; and although, during the progress of the run, he is remarkably crafty, and will avail himself of every means to elude the vigilance of his determined pursuers, yet, even when defeated, he dies game to the very last.

"Imagine yourself placed, as the hounds are drawing the cover, in a stubble-field, immediately adjoining the wood where the earths are situated. Reynard, pursued by a stanch and true pack of well-bred and well-managed hounds, has threaded its most intricate mazes—doubled and redoubled, crossed and recrossed—for the purpose of puzzling his numerous enemies. But check after check follows, and he is at length forced to break cover, which he does very reluctantly. On reaching the stubble-field, just mentioned, he will pause for a moment to listen, taking breath at the same time. His brush is draggled in the dew, and his coat is also wet and discolored. He turns his sharp nose toward the cover, with his ears pricked up to catch the sound of the approach of danger. One fore-foot is elevated; and there he stands, a perfect picture for the skillful and truth-delineating artist. He soon finds that his host of enemies are on the scent; he hears the voice of the huntsmen, the cry of the pack, the cracking of the knotted cord, and that indescribable roar which is peculiar to the chase, with the shrill words of the manager of the pack, 'Yoicks, my hounds! At him, Rover! Yoicks, my pets! Yoicks! Yoicks!' waving his cap, and encouraging them onward. At the same time, the whips in the distance vociferate, 'Broke cover! Gone away! Gone away!' Hearing all this, and perfectly understanding its motive, Reynard plucks up additional spirit and resolution, and flies at an accelerated speed, to reach a distant earth, or some well-known place of refuge and safety, perhaps to leave his home forever, and with the certainty of a desperate chase.

"Nor is the fox the least dexterous in securing his prey. Like the badger, he leaves the earths generally about ten or eleven o'clock at night, unless the state of the weather be extremely unfavorable, and then he prudently stops at home. His sharp bark about midnight indicates his whereabout. He visits farmyards and homesteads, henroosts, and other out-buildings, containing ducks, geese, and turkeys, making, when he can accomplish an entrance, sad havoc among every description of these inhabitants of the farm premises. An instance of the cunning of the fox in his forays occurred a short time ago, and should be related here. A neighbor of ours possessed a large number of fine turkeys, which usually roosted in the branches of some tall Scotch firs, immediately adjoining the farmyard; Reynard had an eye on them, and made several visits during the moonlight nights unsuccessfully. They were perched too high for him to reach them, and therefore he was obliged to resort to stratagem, for stratagem is the fox's stalking-horse.

"Now, how was this to be practiced? Well, he first scratched the ground beneath the tree with his fore-feet, and then the base of the tree itself, in order to draw their attention; at the same time looking up to mark every movement. He then ran round the tree in rapid rings. The turkeys, aware of their danger, followed his quick movements with their eyes, and became confused and dizzy. One fine bird fell plump upon the ground, and was instantly killed, according to the authority of the shepherd, who was watching the proceedings. The like scheme was repeated, and down came another, which shared the same fate. Both were borne off to the earths. The loss of turkey after turkey induced the farmer to watch in ambush, and the truth of this stratagem was fully established. But the cunning animal paid the forfeit of his own life, for he was shot dead while decamping with his last booty.

"The fox will travel a long distance in search of food; but, like a true general, never when he can levy his contributions near home. Thus, also, if the estate in which he is located abounds with game, his visits to the homestead will be of less frequent occurrence, nor will he attack hares, if there be an abundant supply of rabbits. When, however, this is not the case, he will, even in the day-time, seize the hen pheasant, or partridge, upon their nests, as well as the hare upon her 'form,' notwithstanding the alarm created by the crows, which are constantly upon the watch, and have a particular eye to his movements. The fox is thus the means of causing very

extensive destruction among the several descriptions of game. In those woods where foxes abound to a considerable extent, they will so diminish the number of rabbits that very few can be seen at any time. Becoming under these circumstances extremely scarce, even to the foxes themselves, they are compelled to extend their nightly rambles to a considerable distance from home. If there is a young family to be provided for, they are often bold and determined in search of, and in seizing their prey. The old fox will then leave the earths early in the afternoon, or just before the sun has reached the west; and, proceeding very cautiously, will approach the homestead situated nearest the cover, or the dwelling of the woodman. Indeed, they frequently visit the farmyard, and seize the first fowl that comes within their reach, especially if they have strayed a little distance from home. Many instances have occurred, where the old farmyard cock, the father of a numerous progeny, after taking his many wives over five-barred



THE FOX AND THE GOOSE.

gates, has been seized and borne away into the dense cover, notwithstanding his loud but unavailing cries, which have sent his companions homeward in a tremendous hurry and alarm.

"Some years ago, a gentleman had a remarkably fine game-cock from a very celebrated breed. He was seized in the way just described; the alarm was given, a gun was taken, and the trigger pulled. The shot took effect, and the thief was laid prostrate on the ground. The bird, liberated from his grasp, jumped on the body of the fox, clapped his wings, and crowed right lustily—a sufficient proof of his high birth.

"It is a common opinion that if the parent fox fails to bring home a supply of food, to satisfy the cravings of hunger, her own cubs will deprive her of existence. This is somewhat questionable; still, the assertion has been boldly maintained, and its truth is said to have been confirmed. For instance, many years ago, a bark-stripper, who was occupied very early in the morning on the outside of a very intricate cover, saw an old fox returning home with a fine goose upon her back. The man watched the proceedings. A large hay-stack stood near the wood side, and this spot was within a short distance of the earths, which were found in an extremely dense and rocky

locality. The old fox placed the goose on the ground close to the stack, and dashed into the thick underwood. The bark-stripper descended the tree, took possession of the prize, and retired to mark the result. The old fox had evidently gone for the purpose of fetching the cubs, as she soon appeared and conducted them to the very spot where the goose had been deposited. She found that it was gone, and evinced the utmost degree of anxiety and alarm, hurrying about in every direction. The bird could not be found, and the cubs, disappointed of their expected supply of food, flew at the mother and tore her to pieces!

"But, however savage the young foxes may be, the most affectionate care is evinced by the mother for her cubs. Often, on a fine summer evening, she will emerge from her home, near an open green spot; and, after looking cautiously around and attentively listening, her cubs will follow her. She leads them to the open space alluded to, and they commence their playful gambols in the most joyous manner possible, tumbling each other about, sometimes placing



FOXES AT PLAY.

themselves in a row, and commencing the game of leap-frog like a lot of merry schoolboys; sometimes, as there is said to be one fool in all large families, they chase this unfortunate member about in the roughest manner possible, as if to arouse its dormant energies, while the old fox, sitting upon her haunches, marks with a parent's fondness the playfulness of her children. But, on the least note of danger being heard, a low whimper from her is instantly obeyed, and they all immediately disappear to their den.

"The fox seems to possess a mingled humor and love of mischief, almost human. When he encounters a large toad, he will place both his fore-feet beneath its body, and pitch it twenty or thirty feet high, repeating this operation very rapidly until the unfortunate reptile is either disabled or killed.

"Reynard, although extremely cunning and cautious, is at the same time very provident. When the evening twilight is spread over the earth, and the woods have assumed a deeper gloom, and the notes of the feathered race, from the jay to the raven, are wholly hushed, or but faintly

heard, and the drowsy tinklings of bells lull the distant folds, the rabbits will leave their separate burrows, situated on the margin of the cover, for the purpose of feeding in the open land. The fox, bent upon his prowling expedition, may then be dimly discerned, stealing along the broad riding, or taking a shorter cut along a narrower path, to reach the feeding-ground in question. But, in approaching the outside of the cover, and placing himself between the game and its retreat, he exercises remarkable caution. His head is bent close to the ground, his body crouched, his steps are as silent and stealthy as those of the cat, and thus advancing, he is enabled to reach the proper distance for springing upon his victim, which he very rarely fails to secure. But, however dexterous in thus seizing his prey, Reynard is not reckless or thoughtless in regard to his resources. If he has been feeding upon a rabbit, the hind-quarters, for instance, at a distance from home, he will not leave the remainder for either the vermin or the rapacious birds; but, carefully pulling the skin over the flesh, for the purpose of keeping it clean, will bury it in some loose earth, and come back and fetch it the next day.

"The calculation of this species is also remarkable, for two foxes will sometimes act in concert. I knew an instance of this sort in respect to an old hare that had frequently bid defiance to and eluded the speed of the best greyhounds. A fox that knew where the form of this hare was situated, aroused and hunted her like the best trained harrier, and forced her up the long wood-siding. Now, his companion had placed himself in ambush, about half way up. On came the hare, at a rapid rate. The fox last mentioned rushed at her, and missed her; but she was turned in this way into the very teeth of the other; and thus was effected by stratagem what the greyhound had failed to accomplish by speed."

The animal we have been describing is the prominent species, at least in Europe. There are others in different parts of the Eastern continent, as the *V. Bengalensis*, the Kokree of the Mahrattas; the *V. Himalaicus*, resembling the American and European red fox, with a fine rich fur of brilliant and varied colors; and the Caama, *V. Caama*, a small species of Southern Africa. Three species are also mentioned as belonging to the region of the Nile: *V. Niloticus; V. famelicus;* and *V. pallidus*. It should be remarked that none of these are thoroughly known, and some of them may be only varieties.

The Common American Fox, *V. fulvus*, is of a bright reddish color; the nose, the lower parts of the legs, forehead, neck, and flanks, however, being black. It so closely resembles the European fox, that it was for a long time regarded as the same species. It is now known to be distinct. It is extensively distributed throughout North America and the north of Asia, it having been found in Japan. It is common in British America, and several thousand skins are annually collected by the northern British fur-traders. It is still common throughout the United States, and even in New England, where it is pursued with fox-hounds, and shot as it comes within range. Some thousands of skins are thus annually obtained: one individual will often obtain thirty, or more, in a season. In the Southern States the fox is hunted somewhat in the English fashion,—the gray variety being most common in that region. Sir John Richardson says that the species we are describing does not possess the wind of its English namesake,—that it runs with great swiftness for a short distance, but its strength is soon exhausted. We have accounts, however, which seem to show that this animal is quite as enduring as the English one.

This animal feeds on eggs, crickets, rabbits and other small quadrupeds, with such birds as he can seize. Many of them live along the sea-shore, and prey on water-fowl or fish. They do not refuse carrion when hard pressed for food. They also carry off young lambs, geese, turkeys, ducks, and poultry. Everywhere they have the reputation of gormandizers and thieves. When hunted by dogs, on the beaches, they often take to the water for escape. They live in burrows, and bring forth from four to nine at a birth. These are blind, and covered for a time with a soft, yellowish, woolly fur. Sometimes the litter displays a variety of colors, among which are found some marked like the cross fox. They display the same aptitude to cunning as the European fox, although they are less exposed, and therefore less trained in the fine arts peculiar to foxes. When pursued by dogs, they will frequently baffle their pursuers by leaping up on the trunk of a tree. When the pack has passed, they leap down, and trot off in a safe direction.

We are not surprised at the hard names that are given to the fox: he is voracious, thieving,

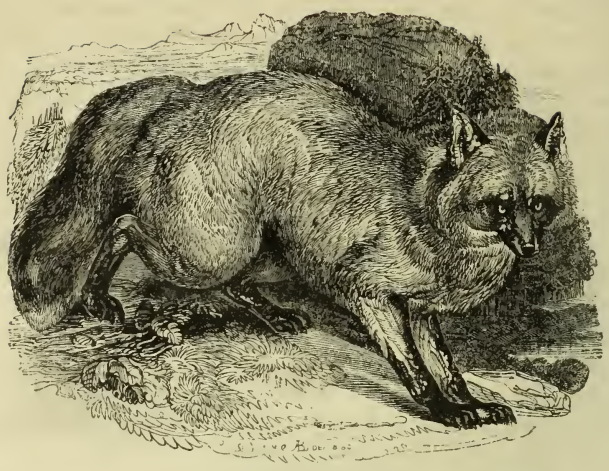


THE FOX BRINGING FOOD TO HER YOUNG.

and destructive; but let us not abuse our own minds by giving a moral and therefore a damning signification to these terms. He lives as he was made to live, and simply obeys the laws of his existence. As he is a disturber of the peace, we claim the right to hunt him and extirpate his race, by virtue of that charter which gave to man dominion over the beasts of the field and the fowls of the air. But we must do justice to Nature and the ways of the Author of Nature. We see a fox steal our geese, our poultry, our lambs; and, with a feeling of holy indignation, delight to see him in a trap or the jaws of the hounds. But, take another view of the case. The fox is impelled by hunger, and must eat or die; nay, he may have a family of young ones that must starve if he fails to bring them food. No moral law restrains him: he has a perfect right to any thing that comes in his way, although he must take the risk of seizing it. Look at the father or mother fox, stealing out at nightfall, knowing that he is waylaid by steel-traps, that in the morning the hounds will be on his track, that his every step is taken in peril of his life. Yet he braves these dangers; he snatches the food from the very jaws of death, and hastens home, not to appease his own hunger but to feed his children. Is there not something holy, beautiful, touching in this—the cunning, thieving, reprobate fox, risking his life and forgetting his appetite, to feed those that God has given him? I believe that often, where man views with hate, God looks down with benignity on his brute creation. May it not be, too, that even in respect to human beings, even those who fall under the ban of society or the law, God is often more merciful than the judgments of man? Man would never have selected a thief on the cross to be an example of mercy: that was the act of God!

The Gray Fox, *V. Virginianus*, is generally of a gray color, varied with black, the sides and neck yellowish red; the colors, however, differ in different specimens. The head is broader and shorter than that of the red fox; the fur coarser, the legs longer, and the body thicker and of a more clumsy aspect. As the red fox prevails at the North, this variety is most common at the South. It is exceedingly voracious, but shy and cowardly. Among the planters of the South, it is an object of aversion on account of its inroads upon the poultry. Although generally nocturnal in its habits, it goes forth at all hours of the day, if necessity or taste incline. At night, it has a hoarse querulous bark, sometimes one fox answering another. When hard pressed in the chase, this animal frequently takes refuge in a tree, which it will climb to the height of twenty or thirty feet. It feeds on partridges, quails, rabbits, and generally on such birds and quadrupeds as it can capture. It does not usually burrow, but makes a kennel, furnished with leaves, in a hollow tree.

The American Cross Fox, *V. decussatus*.—The general color of this animal is red above, and dark brown below: it is distinguished by a black cross on the neck and shoulders, and



THE GRAY FOX.

a black longitudinal stripe on the under surface. In size, form, and face, it resembles the red fox, of which it is a variety. Its skin formerly sold for twenty-five dollars: at present it is only worth three times that of the common red fox. This animal is found from Nova Scotia westward across Maine, Vermont, New Hampshire, New York, and Canada, and northward to Labrador.

The Swift Fox or Kitfox, *V. velox*, is a small, slender species, generally of a gray color. In form it resembles the red fox, and in color the gray fox. It is a beautiful animal, runs with



THE AMERICAN CROSS FOX.

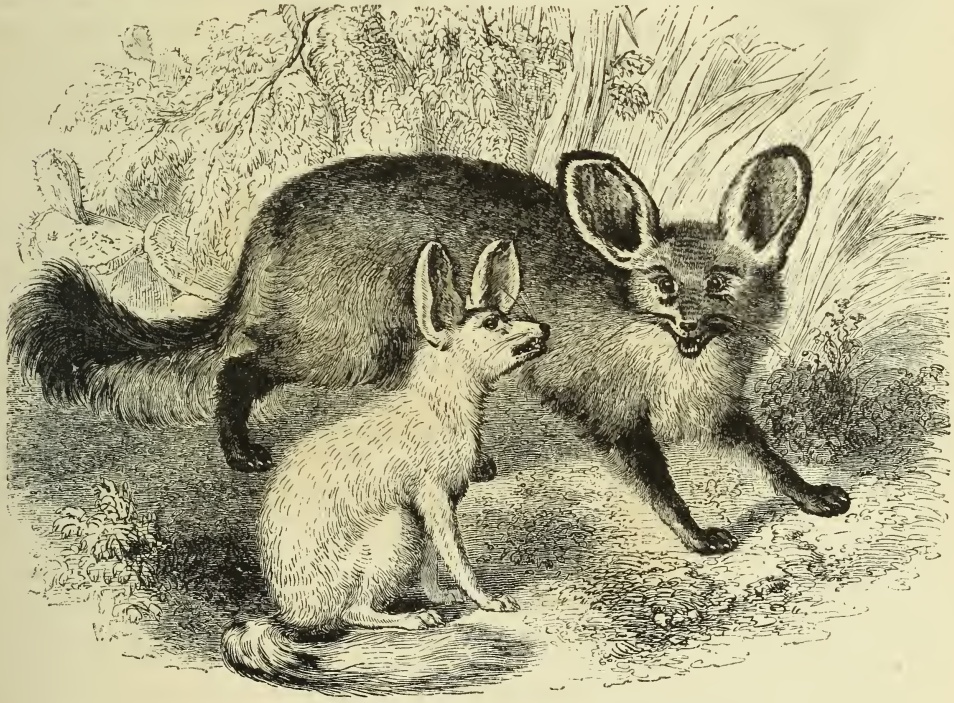
great swiftness, and, if pursued, doubles and winds with admirable skill and alertness. It lives in deep burrows, and is found on the plains and prairies on both sides of the Rocky Mountains, about latitude 49°.

The Silver Fox or Black Fox, *V. argentatus*, of America, is generally regarded as only a variety of the common fox, but Gervais considers it as probably a distinct species. It resembles the variety called *Black Fox* of Europe. The size is that of the common fox, the fur exceedingly long, soft, and rich; and, although presenting great variety in the different species, is generally silvery black, sometimes with a chocolate tinge, the tip of the tail always white. The frontal part of the cranium has a peculiar lyre-shape, distinguishing it from every other species. This animal is found from Hudson's Bay to Pennsylvania, but it is everywhere exceedingly scarce.

Its fur is among the most valuable, being prized in all civilized countries, and especially in Russia and China; a single skin will often sell for fifty or seventy-five dollars. This species displays the general characteristics of the common fox.

The Jackal Fox, *V. Utah*, is larger than the common fox, the fur very long and fine, color grayish brown, and the tail irregularly banded with dark brown and dull white. The hues, however, vary in different specimens. This animal was first noticed by Lewis and Clarke; it is found in the Rocky Mountains, in Utah, in Oregon, and the northern regions traversed by the British fur-traders,—it being nowhere common. The aspect and appearance of this animal are peculiar, and probably it will prove to be a distinct species.

The Arctic Fox, or Isatis, *V. lagopus*, is found in both hemispheres, within the Arctic circle, and is generally white or gray. One variety, called Sooty Fox, or Blue Fox, and erroneously supposed to be a distinct species, has been denominated *V. fuliginosus*. These creatures are gregarious, and in some sandy places their burrows are so numerous as to be called villages. They have not the rank smell of other foxes, and are exceedingly clean in their habits, never soiling their dwellings. They have not the cunning and caution of the red fox, and are easily taken in traps. Their fur is little valued, but their flesh is much esteemed They are numerous from Hudson's Bay to Behring's Straits. The young ones migrate southward late in the autumn, but retire early in the spring to their haunts along the borders of the Arctic Sea. The *V. Azaræ*, *V. Magellanicus*, and *V. Corsac*, are South American varieties or species, very little known.



THE FENNEC. THE OTOCYON.

Genus FENNEC: *Fennec.*—Of this we know but a single species, the *Canis Cerda*, or Fox Fennec, which lives along the borders of the Barbary States, in the Desert of Sahara, and in Central Africa. It is about seven inches long; has long ears, and an exquisite sense of hearing. It is of a pale dove-color, and feeds on the small game of the desert.

Genus OTOCYON: *Otocyon.*—Of this there is but one species, the *Otocyon megalotis*, found in the country of the Hottentots: it seems to combine something of the fox and the civet. Its fur is thick, the tail rather short but bushy, the legs long, the color grayish brown varied with fawn. The length is fifteen inches. Its habits are little known.



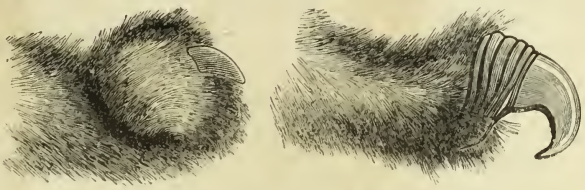
THE DOMESTIC CAT.

THE FELIDÆ, OR CAT FAMILY.

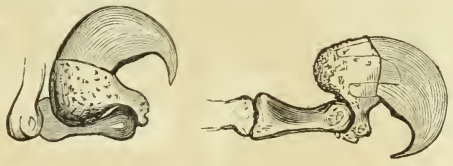
We place at the head of this article an engraving of the soft, pleasant, purring puss of our firesides, for, gentle as she seems, she is the representative of the most predaceous family among quadrupeds. She is, in fact, cousin-german to the lion, the tiger, the cougar, and jaguar, all of which belong to the tribe of cats. The difference between these creatures and puss is, that while she feeds on mice, they feed on sheep, deer, antelopes, and buffaloes, or, if a chance offers, upon man himself. They all make prey of living animals, and are admirably fitted by nature for the war they incessantly wage on other creatures. In their structure, the head is short and almost rounded in its form, for although the zygomatic arches and ridges are greatly developed, the muscles for moving the jaws are so exceedingly large as to fill up all the cavities, and produce a smooth, plump surface. The jaws are short, the dentition consisting of six incisors and one canine, above and below; four præ-molars above and two below, on each side; and two molars above and one below, also on each side. The canines are long, sharp, compressed, and cutting; the præ-molars are furnished with two roots, compressed, pointed, and serrated; the flesh-teeth or true molars are very large, sharp-edged, and terminated by two or three points; and behind the flesh-tooth in the upper jaw there is a small tubercular tooth which is wanting in the lower jaw. In addition to this formidable apparatus of cutting teeth, the tongue in these animals is covered with small recurved prickles, with which they are enabled to lick the last particles of flesh from the bones of their prey.

In the form of their bodies the cats are all light, and excessively muscular, so that their activity is astonishing. Their legs are usually of moderate length, but exceedingly powerful; and the toes—five before and four behind—are armed with long, curved, and acute claws, which are preserved from being blunted by a peculiar arrangement of the phalanges. For this purpose, the last or claw joint of each toe is drawn back, by ligaments attached to the penultimate joint, until it assumes a perpendicular position, when the claw, which it supports, is completely retracted within a sort of sheath, and is entirely concealed by the fur. This is effected by the elasticity

of the ligaments, and without any exertion on the part of the animal. But, when a cat is about to strike its prey, the claw joint is pulled down by the flexor muscles, and the formidable talons are then protruded, ready to be buried in the flesh of the victim. The animals of this family have generally very acute senses, especially those of hearing and sight. The nictating membrane is very large and movable: the glaring or glistening of the eye, in a dim light, seeming as if the ball were on fire, is common to many carnivorous animals, but in none is it so conspicuous as in the cats. This feature gives to the larger species an indescribable look of ferocity, especially when they are excited, either in pursuit of their prey or in conflict with an enemy. The lower surface of the foot is furnished with thick, ball-like pads of the epidermis, upon which the animal walks, and these are the cause of the peculiarly noiseless tread which is characteristic of all the members of this family. They always take their prey by springing suddenly upon it from some concealed station, and, if they miss their aim in the first attack, rarely follow it up. Accordingly they are all cowardly, sneaking animals, and never willingly face their enemy unless brought to bay or wounded, trusting always to their power of surprising their victims by the aid of their stealthy and noiseless movements. They are mostly nocturnal and solitary in their habits; some of them, however, live in families. They never, with a few rare exceptions, unite in troops, like the wolf or the jackal. They are distributed in all parts of the world, with the exception of Australia, but principally in the warmer regions, where alone the larger species are met with.



CAT'S RETRACTILE CLAW, COVERED AND UNCOVERED.



CAT'S CLAW WITH THE FLEXOR MUSCLE.

In our notice of these animals, we shall first describe those of the old continent, and then those of the new.

Genus FELIS.—At the head of this remarkable genus stands the Lion, *Felis leo*, often called, on account of his strength, his aspect, and his general ascendency over the brute creation, the *King of Beasts.*

Although the lion is not a native of our continent, still, nearly every person has become familiar with its appearance, either by representations of it or by seeing it in menageries. The impressions thus obtained are, however, often erroneous, and always imperfect and inadequate. It is necessary, therefore, to describe him as he appears in his natural state.

The male lion has a large head, and, in repose, has a countenance of such gravity as to appear majestic. When excited, his eye flames as with fire, and his aspect becomes terrible. The neck is usually ornamented with a flowing mane, which lends a savage beauty to his grand and noble form. At the same time, he carries his head high, as if conscious of his power and proud of his ascendency. When full grown, the body measures about eight feet; the tail is half that length, and usually terminates in a spine or claw, which, however, is attached only to the skin, and is easily worn off. No use for this is known. The structure of the bones and muscles presents a model of strength and activity. A lion can crush the skull of a buffalo with a stroke of his paw, and can carry off the body of a man, or antelope, as easily as a cat does a rat. One of them has been known to gallop off with a two-year-old heifer, and in its progress to leap a broad dyke with the utmost facility; another to kill a horse, and drag the body to the distance of a mile; and still another, having killed a young cow, to run off with it, and, although pursued by men on horseback for five hours, the body only touched the ground two or three times!

The lion lies in wait for his prey; he creeps near to it, and then rushes upon it with a series of tremendous leaps, seldom failing to secure his prize. The cat, hunting a mouse, is a good example—on a minute scale—of a lion hunting an antelope or a quagga. His nature leads him to seek concealment, to skulk under cover, and to gain his object by stealth rather than open

attack; yet, when actually confronted with an enemy, he often displays the most undaunted courage. Many tales have been told of his good temper and magnanimity. The whole truth on this point seems to be, that when he is not pressed by hunger he is languid or indifferent. If acquaintance be made with him in this state, he often appears magnanimous. A small dog being put into the menagerie of the Garden of Plants, with a lioness, was kindly received and finally became a pet and favorite of the monster, playing with her huge jaws as if they had been those of his mother. The story of Androcles, the Roman—who met a lion in a cave in Africa, and having pulled a thorn out of its foot, from which it was suffering, thereby obtained the creature's good-will—is probably founded in truth, although doubtless embellished. Savage as this animal appears, if taken young, he may be rendered comparatively gentle and tame. Tame lions, led about in golden chains, have long been part of the pageant of a Persian court: almost every menagerie now-a-days has its tame lions. Van Amburgh has obtained a complete mastery, not only over lions, but tigers and other felidæ of the most ferocious character. The lion was created to kill and eat other animals: in fulfilling this law of his nature, he is not more destructive than man himself. Mankind have butchers who kill for the people: the lion only kills for himself and family. His hunger being appeased, he ceases his slaughter until hunger again calls him to action. In general, he does not attack man, in his native wilds; he rather preys on the larger quadrupeds that come within his reach: yet he will attack man when threatened or irritated by him, or when prompted by hunger, especially if he can steal upon him in the early part of the night, when the instinct of destruction is strong upon him. When he has once fed on human flesh, he is said to prefer it; and hence the lions that have been born and bred in the vicinity of towns and villages, have more ferocious habits toward mankind than others.



The lioness is without a mane; she is smaller, less powerful, and far less majestic in appearance than the lion. The sly, skulking, cowardly qualities are also stronger in her. She is jealous and ferocious when her young ones are threatened, and she fearlessly faces any danger in their defense.

The pairing of these animals is thus described by Gérard, a Frenchman who spent some years in lion hunts, in Algeria, and who, on account of his exploits, obtained the title of "the Lion Killer:"

"It is ordinarily at the end of January that the monarch of Africa seeks his royal consort. As the males are, by one third, more numerous than the females, it is not an uncommon occurrence to find one of these dusky belles accompanied by two or three aspirants, who indulge in most desperate battles for her favor. She at last, becoming impatient to find that these gallants do not strangle each other to share her undivided love, leads them toward the haunt of some brave old lion, whose valor is known afar by the thunder of his voice. The disputing lovers arrive with their mistress in the presence of the new rival, and march bravely forward. The negotiations are not long, and the result of the encounter is always certain. Attacked by the three lovers at once, the old lion receives them without moving from his place; he strangles the first with a grasp of his jaws, the second is thrown aside with a broken leg, and the third feels himself very happy if he can get away from the battle with one eye, which he very hastily does, leaving the other in the claws of his master.

"The place once clear, the noble victor shakes out his mane to the wind, with a long roar, and then comes and stretches himself at the feet of his love, who, for the first mark of her favor, licks the wounds he has received on her account with a fawning grace that awakens the tenderest emotions in his susceptible heart. When two old lions meet upon the same adventure, the affair is not so gayly terminated. Mohammed, an Arab of the tribe of Kesenna, told me of a combat of this nature where he was a spectator, although much against his will. It was in the pairing season for stags, and Mohammed, a great hunter of every kind of wild animals, perched himself at sunset in the boughs of an oak-tree, to watch for a doe that he had seen wandering in the vicinity, accompanied by several stags. The tree which he had climbed was situated in the middle of a large clearing, and near a path that led into the neighboring forest. Toward midnight he saw a lioness enter the clearing, followed by a red lion with a full-grown mane. The lioness strolled from the path, and came and laid herself down at the foot of the oak, while the lion remained in the path, and seemed to be listening to some noise as yet inaudible to the hunter.

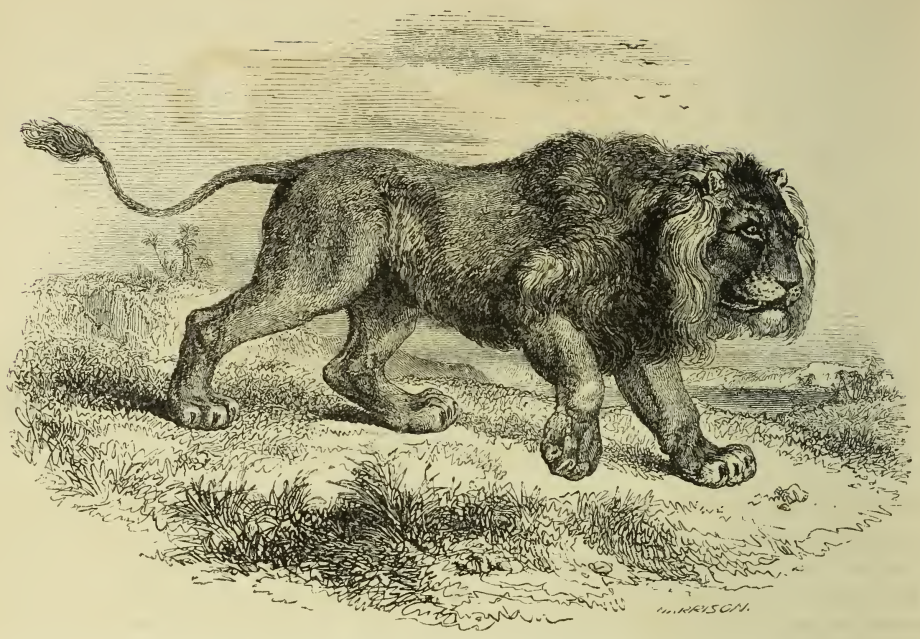


"Mohammed then heard a distant roaring in the forest, and immediately the lioness answered it. Then the lion commenced to roar with a voice so loud that the frightened hunter let fall his gun, and held on the branches with both hands, lest he might tumble from the tree. As the voice of the animal that had been heard in the distance gradually approached, the lioness welcomed him with renewed roarings, and the lion, restless, went and came from the path to the lioness, as though he wished her to keep silence, and from the lioness to the path, as though to say, 'Let him come, the vagabond, he'll find his match.'

"In about an hour a large lion, as black as a wild boar, stepped out of the forest and stood in the full moonlight on the other side of the clearing. The lioness raised herself to go to him, but the lion, divining her intent, rushed before her and marched straight at his adversary. With step measured and slow, they approached to within a dozen paces of each other—their great heads high in air, their tails slowly sweeping down the grass that grew around them. They crouched to the earth—a moment's pause—and then they bounded with a roar high in air, and rolled on the ground, locked in their last embrace. The battle was long and fearful to the involuntary witness of this midnight duel. The bones of the combatants cracked under their powerful jaws, their talons strewed the grass with entrails, and painted it red with blood, and their roarings, now guttural, now sharp and loud, told their rage and agony.

"At the beginning of the contest, the lioness crouched herself on her belly, with her eyes fixed upon the gladiators, and all the while the battle raged, manifested, by the slow cat-like motion of her tail, the pleasure she felt at the spectacle. When the scene closed, and all was quiet and silent in the moonlight glade, she cautiously approached the battle-ground, and snuffing the dead bodies of her two lovers, walked leisurely away, without deigning to answer the gross, but appropriate epithet that Mohammed hurled at her as she went, instead of a bullet.

"This example of the conjugal coquetry and fidelity of the lioness is applicable to all her species. What she desires is a lover full grown and brave, who will drive away the young lions, whose beardless chins and constant quarrels offend her delicacy and trouble her repose. Such a



A LION STEALING UPON HIS PREY.

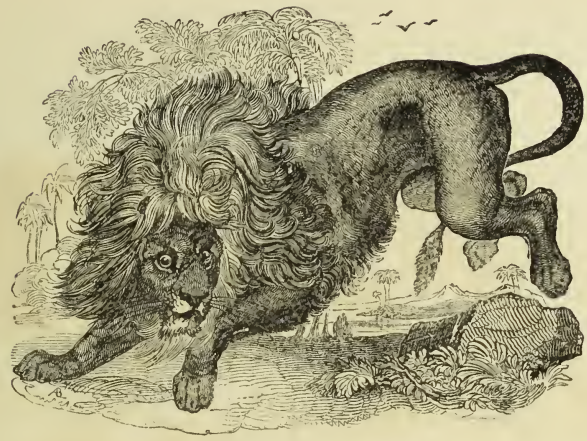
lover she is sure to find, although she may not keep him, for the moment that a braver lion appears she gives him always a ready welcome. From what I have seen of the lion, I am led to believe that he has a more faithful heart than his fickle spouse, and never, unless forced to do so, changes his mistress, but takes her for better or for worse, during the whole term of his matrimonial connection, and he shows for her an affection and care that are worthy of a better return.

"When the royal couple leave their lair, both in going and returning, the lioness always leads the way, and when she pauses in her walk, the lion stops till she is ready to go on. After arriving at some Arab encampment where their supper is to be procured, the lioness lies down at a short distance off, while the lion bounds bravely into the inclosure, and selects for her whatever is best to her taste, and lays it down at her feet. He watches her with great pleasure while she makes her repast, and never thinks of eating himself until she is satisfied. In a word, there is no form of tenderness that he does not manifest for her, either during or after the honeymoon.

"When the lioness becomes heavy with young, which occurs during the latter part of December or the first of January, she seeks a dense and impenetrable ravine, where she may deposit her offspring. The litter varies in number from one to three, depending upon the age and vigor of the lioness, but there are ordinarily two cubs, one male and one female.

"During the first few days after becoming a mother, she never leaves her cubs, even for an instant, and the father provides for all their wants. It is only after they have reached the age of three months, and have finished teething, that the mother goes out to get food for them, and then is absent only a few hours each day. On her return, she brings them mutton or some other simple food, carefully skinned and torn in small pieces. The crisis of teething is a very important one in the life of the lion cubs, and a large number die at that period. The male lion, who is of a very grave and reserved character when old, does not love to stay by his offspring, whose childish gambols offend his dignity; and, in order to be more tranquil, he selects a sleeping apartment in the jungle, near that of his wife, and where he may be called in case of need.

"At the age of from four to five months, the whelps follow their mother during the night to the edge of the woods, where they wait for the lion to bring them their dinner. At the age of six months, and during a dark night, the whole family change their domicile; and from this



A LION SPRINGING UPON HIS PREY.

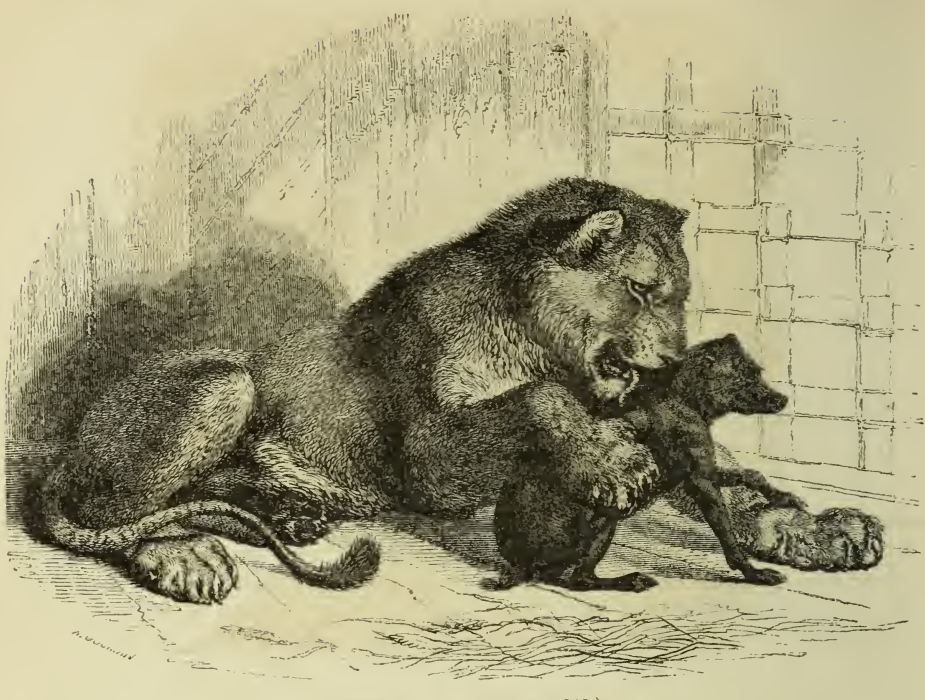
moment up to the time they finally leave their parents, the young lions constantly follow the old ones in pursuit of prey. From eight months to one year old, they commence to attack the flocks of sheep or goats that may be found wandering in the vicinity of their retreat. Sometimes they try their hand at catching horned cattle, but they are yet so awkward that there are often ten wounded for one killed, and their father is obliged to come in and interfere, lest they go supperless to bed.

"It is not until they are two years old that they know how to strangle a horse, an ox, or a camel, with one grasp of the jaw at the throat of the animal, and to leap the hedges seven feet high, that are reputed to protect the Arab douars. This period, from the time of the birth of the cubs until they are two years old, is truly ruinous for the people of the country inhabited by one of these happy families. Indeed, they not only kill to eat, but they kill to learn to kill. It is easy to understand what such an apprenticeship must cost to those who furnish the materials for the clumsy tyros.

"When the whelps reach the age of three years they leave their parents in order to get married; and the old couple, unwilling to remain alone, replace them by a new family. The lions are not full grown until their eighth year, and then they attain their full strength and size, and the male, a third larger than the female, grows his full mane. We should not judge the lion living in his wild state, by his degenerate brother confined in a menagerie. The latter has been taken from its mother before being weaned, and has been raised like a rabbit, deprived of the maternal milk, and debarred from the desert life of liberty, and the living food its bravery conquered. From his seclusion arises his meager form, his unhappy look, his unhealthy shape, and his lack of mane which gives him the appearance of a spaniel, and makes him an alien to his forest brother.

"There are in Algiers three species of lions: the *Black Lion*, the *Red* or *Tawny Lion*, and the *Gray Lion*, and they are styled by the Arabs, *el adrea*, *el asfar*, and *el zarzouri*. The black lion is a much rarer animal than the others, and has a more powerful head, neck, shoulders, and legs. The lower part of his body is clad in a robe of the color of a dark bay horse, and the shoulders are covered by a long, heavy black mane, that falls down on either side almost to the ground, and gives to him an air not at all reassuring. The breadth of his forehead is eighteen inches; the length of his body, from the tip of his nose to the root of the tail, measures seven feet and a half, and his tail, three feet. The weight of his body varies between six hundred and six hundred and sixty pounds.

"The Arabs are more afraid of this lion than the two others, and they have good reason to be. Instead of migrating from place to place, the black lion takes up his residence in some favorite retreat, and remains there sometimes thirty years. He rarely descends into the plain to get his food in the Arab camps, but, in revenge for this forbearance, lies in wait for the herds as they descend the mountain, and kills four or five beasts, merely for the pleasure of drinking their



LIONESS AND DOG.—(See p. 248.)

blood. In the summer season, when the days are long, he goes out at the setting of the sun, and crouches by some frequented path, where 'the tinkling caravan descends the mountain road,' or watches for a traveler with his horse, or some belated herdsman.

"The tawny lion and the gray lion do not differ from each other, except in the color of the mane, and are a little larger than the black lion, and not so short. With the exception of the differences we have just shown, all the three species have the same character and habits. The life of this animal may be divided into two distinct eras, in which he seems to be, after a manner, an entirely different being, which difference has given rise to a thousand errors respecting him; these two eras are the day and night. In the day-time, he is accustomed to retire into the depths of the woods, at a distance from all noise, to sleep and digest his meals at his leisure. In the night, he roams abroad, the king of the universe. It has been said that the lion will not attack a man, because perchance a man has found himself face to face with one that the flies or the sun has obliged to change his lair, or that has come down to the water to drink, and yet escaped with impunity, without remembering that the drowsy epicure was half asleep, and sated with food. He does not kill for the pleasure of killing, but to satisfy his hunger, or to defend himself when attacked. In a country like Algiers, literally covered with herds, he is never fasting, except during the day, while sleeping; and the natives, knowing this, take care to stay at home when he quits his lair, or, if they are obliged to travel at night, they never go on foot or alone. As to myself, I will say that if I have noticed an indifferent expression on the countenance of several lions whom I have met abroad early in the evening, I never saw those that I met at night exhibit other than the most hostile disposition. I am so sure that a single man is inevitably lost if he meets with such an encounter, that when I am bivouacking in the mountain, I never leave my tent after sunset for an instant, except with my carbine in my hand."

The roaring of the lion is described by most travelers as exceedingly grand and often terrific. It is a curious fact that these creatures become most active in tempestuous weather; at night, in the midst of the terrific thunder-storms that take place in tropical Africa, the roarings of the lion seem actually to challenge the thunder and the lightning. At such times, several of them will often roar in concert, thus adding a feature of terrific grandeur to the awful anthems of nature.



MEETING OF THE LIONS.—(See p. 249.)

Gérard thus speaks on this subject: "When a lion and a lioness are together, the female always roars first, and at the moment when the couple is leaving its lair. The roar is composed of a dozen distinct sounds, which are commenced by low sighing, and then go on *crescendo*, and finish as they began, leaving an interval of a few seconds between each sound; the lion then alternates with the lioness. They roar in that manner every quarter of an hour up to the moment when they approach the encampment that they are about to attack, when they both keep silence; but after they have taken and eaten their food, they recommence their melancholy music and continue it until morning.

"A solitary lion generally roars as he rises from his slumber at the commencement of the night, and will often continue his thundering challenges without cessation until he reaches the encampments. During the great heats of summer the lion roars but little, and sometimes not at all; but as the season of his amours advances, he makes up for the time lost in silence. The Arabs, whose language is rich in comparisons, have but one word for the roaring of the lion, and that is *rad*, thunder.

"Among other foolish questions I have had asked me, is: 'Why does the lion roar?' I would say that the roaring of the lion is to him what to the bird is his musical song, and if the questioner does not believe the fact, if he will go to the forests and pass several years in his company, he may perchance find a better explanation." We may add that many authors have supposed that the roaring of the lion was instinctive, its main object being to startle the animals on which he wishes to prey, from their hiding-places, so that he may see them, and in their confusion fall upon and seize them.

The author we have just quoted furnishes the following curious statistics: "The average length of the life of the lion is from thirty to forty years. He kills or consumes, year by year, horses, mules, horned cattle, camels, and sheep, to the value of twelve hundred dollars; and taking the average of his life, which is thirty-five years, each lion costs the Arabs forty-two thousand dollars. The thirty animals of this species living at the present moment, in the province of Constantine, and whose loss is replaced by others coming from Tunis or Morocco, are sustained by an annual cost of thirty-six dollars!"

These accounts, it will be remembered, relate to the lions of Northern Africa, which live in the vicinity of towns and settlements. Travelers and adventurers in the more southern and less settled portions, give the same general representation of this formidable beast.

The following sketch, among many similar ones, furnished by Mr. Cumming—a modern British Nimrod—who spent some months in hunting the monsters of Africa, gives a fearful picture of their banquets. It will be understood that the narrator had shot three rhinoceroses near a fountain, and soon after twilight had died away, he came down to the water to watch for lions. With him was his Hottentot attendant, Kleinboy:

"On reaching the water I looked toward the carcass of the rhinoceros, and to my astonishment I beheld the ground alive with large creatures, as though a troop of zebras were approaching the water to drink. Kleinboy remarked to me that a troop of zebras were standing on the height. I answered 'Yes;' but I knew very well that zebras would not be capering around the carcass of a rhinoceros. I quickly arranged my blankets, pillow, and guns in the hole, and then lay down to feast my eyes on the interesting sight before me. It was bright moonlight, as clear as I need wish. There were six large lions, about twelve or fifteen hyenas, and from twenty to thirty jackals, feasting on and around the carcasses of the three rhinoceroses. The lions feasted peaceably, but the hyenas and jackals fought over every mouthful, and chased one another round and round the carcasses, growling, laughing, screeching, chattering, and howling, without any intermission. The hyenas did not seem afraid of the lions, although they always gave way before them; for I observed that they followed them in the most disrespectful manner, and stood laughing, one or two on either side, when any lions came after their comrades to examine pieces of skin or bones which they were dragging away."

The following account of an attack by one of these lion "*man-eaters*," as they are called—for having once tasted human flesh they will eat nothing else if it can be obtained—is by the same adventurous person. He and his party had, unknown to themselves, pitched their camp in the proximity of a lion of this description. All had retired to rest, when

"Suddenly," says the narrator, "the appalling and murderous voice of an angry, blood-thirsty lion burst upon my ears within a few yards of us, followed by the shrieking of the Hottentots. Again and again the murderous roar of attack was repeated. We heard John and Ruyter shriek, 'The lion! the lion!' Still for a few moments we thought he was but chasing one of the dogs round the kraal, but the next instant John Stofulus rushed into the midst of us, almost speechless with fear and terror, his eyes bursting from their sockets, and shrieked out, 'The lion! the lion! He has got Hendrick! He dragged him away from the fire beside me. I struck him with the burning brands upon his head, but he wouldn't let go his hold. Hendrick is dead! O God! Hendrick is dead! Let us take fire and seek him.' The rest of my people rushed about shrieking and yelling as if they were mad. I was at once angry with them for their folly, and told them that if they did not stand still and keep quiet, the lion would have another of us, and that very likely there was a troop of them. I ordered the dogs, which were nearly all fast, to be made loose, and the fire to be increased as far as could be. I then shouted Hendrick's name; but all was still. I told my men that Hendrick was dead, and that a regiment of soldiers could not now help him, and hunting my dogs forward, I had every thing brought within my cattle kraal, when we lighted our fire and closed the entrance as well as we could. It appeared that when the unfortunate Hendrick rose to drive in the ox, the lion had watched him to his fireside, and he had scarcely lain down when the brute sprang upon him and Ruyter—for both lay under one blanket—with his appalling roar; and roaring as he lay, grappled him with his fearful claws, and kept biting him on the breast and shoulder, all the while feeling for his neck; having got hold of which, he at once dragged him away backward round the bush into the dense shade. As the lion lay on the unfortunate man, he faintly cried, 'Help me! help me! O God! Men, help me! After which, the fearful beast got hold of his neck, and then all was still, except that his comrades heard the bones of his neck cracking between the teeth of the lion." It is satisfactory to know that on the following day Mr. Cumming took revenge on the lion, whose huge grisly hide he afterward exhibited in London.

Pringle, the celebrated traveler in Southern Africa, gives us the following sketch. His party, it

must be understood, consisted of seventeen horsemen, Mulattoes and Hottentots, and a number of powerful hounds:

"The Hottentots traced the lion on foot, discovering his spoor, or track, with surprising dexterity, and found him in a large thicket about a mile distant. The dogs failed to dislodge him; the Mulattoes rode round the jungle and fired into it, but without effect. At last three Scotchmen determined to march in, provided the Mulattoes would support their fire. Regardless of the warnings of more prudent men, they went in, and, as they thought, found the lion crouched among the roots of a large evergreen bush, glaring at them from under the foliage. They fired and struck, not the lion, but a great block of sand-stone, which they had mistaken for him; but beyond which he was actually lying. With a furious growl he bolted from the bush; the Mulattoes fled, helter-skelter, leaving the Scots with empty guns, tumbling over each other in their haste to escape. In a twinkling he was upon them, with one stroke of his paw dashed John Rennie to the ground, and with one foot upon him, looked round upon his assailants in conscious power and pride, and with the most noble and imposing port that could be conceived. It was the most magnificent thing I ever witnessed; but the danger of our friends was too great to enjoy the picture. We expected every minute to see one or more of them torn to pieces; and yet in their position, one lying under the lion's paw, and the others scrambling toward us, we dared not fire. Fortunately, however, the lion, after steadily surveying us, turned calmly away, drove off the hounds with his heels, as if they had been rats, and bounded over the adjoining thicket like a cat, clearing bushes twelve or fifteen feet high, as if they had been tufts of grass.

"Our comrade had sustained no other injury than a scratch upon the back and a severe bruise, and we renewed the chase. We found the enemy standing at bay under a mimosa-tree. The dogs barked round him, but were afraid to approach; for he growled fiercely, and brandished his tail in a manner that showed that he meditated mischief. The Hottentots, by taking a circuit, reached a precipice above him, and another party of us occupied a position on the other side of the glen, so that the lion was between two fires; he became confused; we battered away at him, and he fell, pierced with many wounds. He appeared to be full grown, and six years old, measuring eleven feet from the nose to the tip of the tail. His fore-leg, below the knee, was so thick that I could not span it with both hands; his head was almost as large as that of an ordinary ox. His flesh, which I had the curiosity to taste, resembled very white coarse beef, and was insipid rather than disagreeable."

It would be easy to fill a volume with similar accounts. Mr. Livingstone, whose recent travels in Southeastern Africa, have excited such general interest, seems to think the lion a more cowardly and much less dangerous animal than he has been reported to be; his work, however, furnishes us with the following exciting incident:

"The Bakátla of the village Mabotsa were much troubled by lions, which leaped into the cattle-pens by night, and destroyed their cows. They even attacked the herds in open day. This was so unusual an occurrence that the people believed that they were bewitched—'given,' as they said, 'into the power of the lions by a neighboring tribe.' They went once to attack the animals, but, being rather a cowardly people compared to Bechuanas in general on such occasions, they returned without killing any.

"It is well known that if one of a troop of lions is killed, the others take the hint and leave that part of the country. So, the next time the herds were attacked, I went with the people, in order to encourage them to rid themselves of the annoyance by destroying one of the marauders. We found the lions on a small hill about a quarter of a mile in length, and covered with trees. A circle of men was formed round it, and they gradually closed up, ascending pretty near to each other. Being down below on the plain with a native schoolmaster, named Mebálwe, a most excellent man, I saw one of the lions sitting on a piece of rock within the now closed circle of men. Mebálwe fired at him before I could, and the ball struck the rock on which the animal was sitting. He bit at the spot struck, as a dog does at a stick or stone thrown at him; then leaping away, broke through the opening circle and escaped unhurt. The men were afraid to attack him, perhaps on account of their belief in witchcraft. When the circle was re-formed, we saw two other lions in it; but we were afraid to fire lest we should strike the men, and they allowed



MR. LIVINGSTONE STRUCK DOWN BY A LION.

the beasts to burst through also. If the Bakátla had acted according to the custom of the country, they would have speared the lions in their attempt to get out. Seeing we could not get them to kill one of the lions, we bent our footsteps toward the village; in going round the end of the hill, however, I saw one of the beasts sitting on a piece of rock as before, but this time he had a little bush in front. Being about thirty yards off, I took a good aim at his body through the bush, and fired both barrels into it. The men then called out, 'He is shot, he is shot!' Others cried, 'He has been shot by another man, too; let us go to him!' I did not see any one else shoot at him, but I saw the lion's tail erected in anger behind the bush, and turning to the people said, 'Stop a little, till I load again.'

"When in the act of ramming down the bullets, I heard a shout. Starting, and looking half round, I saw the lion just in the act of springing upon me. I was upon a little height; he caught my shoulder as he sprang, and we both came to the ground below together. Growling horribly close to my ear, he shook me as a terrier dog does a rat. The shock produced a stupor similar to that which seems to be felt by a mouse after the first shake of the cat. It caused a sort of dreaminess, in which there was no sense of pain nor feeling of terror, though quite conscious of all that was happening. It was like what patients partially under the influence of chloroform describe, who see all the operation, but feel not the knife. This singular condition was not the result of any mental process. The shake annihilated fear, and allowed no sense of horror in looking round at the beast. This peculiar state is probably produced in all animals killed by the carnivora; and if so, is a merciful provision by our benevolent Creator for lessening the pain of death. Turning round to relieve myself of the weight, as he had one paw on the back of my head, I saw his eyes directed to Mebálwe, who was trying to shoot him at a distance of ten or fifteen yards. His gun, a flint one, missed fire in both barrels; the lion immediately left me,

and, attacking Mebálwe, bit his thigh. Another man, whose life I had saved before, after he had been tossed by a buffalo, attempted to spear the lion while he was biting Mebálwe. He left Mebálwe and caught this man by the shoulder, but at that moment the bullets he had received took effect, and he fell down dead. The whole was the work of a few moments, and must have been his paroxysms of dying rage. In order to take out the charm from him, the Bakátla on the following day made a huge bonfire over the carcass, which was declared to be that of the largest lion they had ever seen. Besides crunching the bone into splinters, he left eleven teeth wounds on the upper part of my arm."

The following curious facts are furnished by the same writer:

"The same feeling which has induced the modern painter to caricature the lion, has led the sentimentalist to consider the lion's roar the most terrific of all earthly sounds. We hear of the 'majestic roar of the king of beasts.' It is, indeed, well calculated to inspire fear if you hear it in combination with the tremendously loud thunder of that country, on a night so pitchy dark that every flash of the intensely vivid lightning leaves you with the impression of stone-blindness, while the rain pours down so fast that your fire goes out, leaving you without the protection of even a tree, or the chance of your gun going off. But when you are in a comfortable house or wagon, the case is very different, and you hear the roar of the lion without any awe or alarm. The silly ostrich makes a noise as loud, yet he never was feared by man. To talk of the majestic roar of the lion is mere majestic twaddle. On my mentioning this fact some years ago, the assertion was doubted, so I have been careful ever since to inquire the opinions of Europeans, who have heard both, if they could detect any difference between the roar of a lion and that of an ostrich; the invariable answer was, that they could not when the animal was at any distance. The natives assert that they can detect a variation between the commencement of the noise of each. There is, it must be admitted, considerable difference between the singing noise of a lion when full, and his deep, gruff growl when hungry. In general, the lion's voice seems to come deeper from the chest than that of the ostrich, but to this day I can distinguish between them with certainty only by knowing that the ostrich roars by day and the lion by night."

It is well known that Africa has ever been the principal home of the lion. It is still found in nearly all parts of that continent in three varieties—the *Black Lion*, the *Red Lion*, and the *Gray Lion*. The lions of Asia are known under three names, but whether they are distinct species or mere varieties, is not established. The *Bengal Lion* is said to be of a darker color, more graceful form, and a less extensive mane than the African lion. The *Persian* or *Arabian Lion* is distinguished by the pale isabella color of its hair. The *Guzerat* or *Maneless Lion*, instead of a flowing mane, has only long hairs standing up along the neck and shoulders.

The habits of the Asiatic lions do not differ much from those of Africa, excepting that the former, from the state of the country, frequent jungles. In India the elephant is generally employed in the chase, which is conducted with more pomp and circumstance than in any other country. The grand Asiatic huntings of former times, those of Genghis Khan for instance, will occur to many of our readers. The accounts of most modern sportsmen give a very courageous bearing to the Asiatic lions in these encounters. One of them states that the lions in India, instead of running away when pursued through a jungle, seldom take to cover as a refuge at all. On the approach of their enemies, they spring out to meet them open-mouthed in the plain. They are thus easily shot; but if they are missed or only slightly wounded, they are most formidable adversaries. They are even said to have sprung on the heads of the largest elephants, and to have fairly pulled them to the ground, riders and all.

The lion is only found in certain districts of Asia; he is nowhere numerous. Here as well as in Africa, his numbers are being daily diminished. Not only the human inhabitants attack him, and with improved and improving weapons and modes of destruction, but other animals sometimes dispute, and with effect, his proud title of King of the Beasts. This is especially the case in Africa. The oryx has been known to plunge its long straight horns through his body, leaving him dead on the spot; and the cow-buffalo, in defense of her calf, sometimes rushes upon him and gores him to death with her horns. The history of the lion, as far as we can trace it, is that of the most powerful, but still a constantly diminishing species. Their strength, their ferocity, their



BUFFALO GORING A LION.

destructiveness—the very qualities which constitute their glory—arm the world against them, and will be the means of their final extirpation. Formerly they were found in Europe, for Herodotus tells us that the camels of Xerxes, in his invasion of Greece, were attacked by lions in what is now the Turkish province of Roumelia. But they have long since disappeared from Europe, and even from Egypt, Palestine, and Syria, where they were once common. The various allusions to these animals in the Sacred Scriptures prove a familiarity with the habits of the race. Even in Asia, excepting some districts of Arabia, and parts of Persia and India, these magnificent beasts are very rare. The war that mankind has incessantly waged against them has thinned their ranks, and probably not only the lion, but the tiger, the rhinoceros, and the giraffe, will ere long become extinct. In forty years a thousand lions were taken to ancient Rome, and perished in the fights of the arena. In more modern times the use of fire-arms has made constant havoc among these animals wherever they have come in contact with man. Within a few years the spirit of Nimrod has led various mighty hunters, such as Harris, Cumming, Anderson, Gérard, and others, into the wilds of Africa in pursuit of the enormous animals which teem in those solitary regions; and by these daring men, not only elephants, giraffes, hippopotami, buffaloes, and rhinoceroses, but lions have been slaughtered almost like rabbits. Everywhere the work of destruction goes on, and year by year the lion becomes more rare. A century hence he will probably be among those creatures that all have heard of, but which it has been the fortune of few to behold. Rats, mice, and mosquitos will flourish long after the lion has become a mere tradition. Such is the glory of the King of Beasts—a glory founded in fear, and begetting universal hate. Perhaps the glory of some other kings may, in future ages, be likened thereunto.

The Tiger, or Royal Tiger, *Felis tigris*, stands next the lion in size; if the latter is a model of strength and grandeur, the former is the personification of beauty and grace. This animal is so common in the menageries, that we need only give a short description of it. The body is



THE ROYAL TIGER.

long, usually six to eight feet, but sometimes measuring ten and even twelve feet; the head is short and round: there is no mane. The ground-color is a pale yellow, elegantly striped by a series of transverse black bands or bars, which occupy the sides of the head, neck, and body, and are continued upon the tail in the form of rings, the last of the series unif rmly occupying the extremity of that organ, and giving it a black tip of greater or less extent. The under parts of the body, and the inner sides of the legs, are almost entirely white. The whole frame, although less elevated than that of the lion, is of a slenderer and more graceful make. Its movements are exceedingly easy and graceful. When pleased, it purs and rubs itself against the nearest object, like a cat. It lurks in the jungles, and makes prey of such animals as come in

its way. The bound with which it throws itself upon its victim is terrific: in these attacks, it often makes a leap of fifty feet. Such is its strength, that man is a mere puppet in its gripe: even the Indian buffalo, which is as large as our ox, is not only borne down by this ferocious beast, but is dragged off by it without difficulty. The tigress has three to five cubs at a birth; in their defense she is even more fierce than the lioness.

The tiger, of which there is but a single species—although there is a Chinese variety, which is of a paler color, and sometimes, it is said, of a white ground, with black and gray stripes—is found only in Asia. It is most common in Hindostan, where it reigns supreme in the wilds, complete master of the animal kingdom. It is met with in various parts of Central Asia, and in some of the great Asiatic islands: in certain districts of Sumatra it is the scourge of the country, being permitted to go on increasing because of a superstitious notion of the people that it is animated by the souls of their ancestors, and therefore it must not be destroyed. It lurks among the bushes along the sides of rivers, and so numerous is the race that they have nearly depopulated many places.

Various devices have been put in requisition to take or annihilate this destructive quadruped. Ten rupees were formerly offered by the East India Company for every tiger destroyed within the provinces where their power and influence extended—a small reward, but sufficient, conjointly with the depredations of the animal, to stimulate the poorer classes to destroy it.

A kind of spring-bow was formerly laid in its way, and discharged a poisoned arrow, generally with fatal effect, when the animal came in contact with a cord stretched across its path; and this method is said to be still in use in some places. Again, a heavy beam was suspended over the way traversed by the tiger, which fell and crushed him on his disengaging a cord which let the beam fall. A Persian device is said to consist of a large, spherical, and strongly interwoven bamboo cage, or one made of other suitable materials, with intervals throughout, three or four inches broad. Under this shelter, which is picketed to the ground in the tiger's haunt, a man provided with two or three short strong spears takes post by night, with a dog or a goat as his companion, wraps himself in his quilt and goes to sleep. A tiger arrives, of whose presence the man is warned by the dog or the goat, and generally after smelling about, rears himself up against the cage, upon which the man stabs him resolutely with his short spear through one of the interstices of the wicker-work.

It seems ludicrous to talk of taking a tiger with bird-lime; but it is said to be so captured in Oude. When a tiger's track is ascertained, the peasants, we are told, collect a quantity of leaves resembling those of the sycamore, and which are common in most Indian underwoods; these they smear with a kind of bird-lime, which is made from the berries of an indigenous and by no means scarce tree, and strew them with the adhesive substance uppermost, in some gloomy spot to which the tiger resorts in the heat of the day. If he treads on one of the limed leaves he generally begins by trying to shake it from his paw, and not succeeding, proceeds to rub it against his jaw in order to get rid of it. Thus his eyes and ears become agglutinated, and the uneasy animal rolls, perhaps, among many more of the smeared leaves, till he becomes enveloped: in this state he has been compared to a man who has been tarred and feathered. The tiger's irritation and uneasiness find vent in dreadful howlings, on which the peasants hasten to the spot, and shoot him without difficulty.

The tiger-hunt, as practiced in India, is perhaps the grandest and most exciting of wild sports. Upon such occasions the whole neighborhood is on the move, and two hundred elephants have been known to take the field. From ten to thirty of these gigantic animals, each carrying sportsmen armed with rifles, have frequently started for the jungle. An English writer gives the following account of one of these expeditions:

"We had elephants, guns, balls, and all other necessaries prepared, and about seven in the morning we set off. The jungle was generally composed of corinda-bushes, which were stunty and thin, and looked like ragged thorn-bushes; nothing could be more desolate in appearance; it seemed as if we had got to the furthest limits of cultivation or the haunts of men. At times the greener bunches of jungle, the usual abodes of the beasts of prey during the day-time, and the few huts scattered here and there, which could hardly be called villages, seemed like islands in

the desert waste around us. We stopped near two or three of these green tufts, which generally surrounded a lodgment of water, or little pond, in the midst of the sand.

"The way in which these ferocious animals are traced out is very curious, and if related in England would scarcely be credited. A number of unarmed, half-naked villagers, go prying from side to side of the bush, just as a boy in England would look after a stray sheep, or peep after a bird's nest. Where the jungle was too thick for them to see through, the elephants, putting their trunks down into the bush, forced their way through, tearing up every thing by the roots before them. About four miles from our tents we were all surrounding a bush, which might be some fifty yards in circumference—our *all* including William Fraser, alone upon his great elephant, Mr. Barton and myself upon another equally large, Mr. Wilder upon another, and eight other elephants, with horsemen at a distance, and footmen peeping into the bushes. Our different elephants were each endeavoring to force his way through, when a great elephant without a *howdah* on his back, called 'Muckna,' put up, from near the center of the bush, a royal tiger. In an instant Fraser called out, 'Now, Lady H., be calm, be steady, and take a good aim; here he is!' I confess, at the moment of thus suddenly coming upon our ferocious victim, my heart beat very high, and for a second I wished myself far enough off; but curiosity, and the eagerness of the chase, put fear out of my head in a minute; the tiger made a charge at the Muckna, and then ran back into the jungle. Mr. Wilder then put his elephant in, and drove him out at the opposite side. He charged over the plain away from us, and Wilder fired two balls at him, but knew not whether they took effect. The bush in which he was found was one on the west bank of one of those little half-dry ponds of which I have spoken. Mr. Barton and I conjecturing that, as there was no other thick cover near, he would probably soon return, took our stand in the center of the open space; in a minute the tiger ran into the bushes on the east side; I saw him quite plain; we immediately put our elephant into the bushes, and poked about till the horsemen, who were reconnoitring round the outside of the whole jungle, saw him slink under the bushes to the north side; hither we followed him, and from thence traced him, by his growling, back to the outer part of the eastern bushes. Here he started out just before the trunk of our elephant, with a tremendous growl or grunt, and made a charge at another elephant further out on the plain, retreating again immediately under cover. Fraser fired at him, but we suppose without effect; and he called to us for our elephant to pursue him into his cover.

"With some difficulty we made our way to the inside of the southern bushes; and as we were looking through the thicket, we perceived beau tiger slink away under them. Mr. Barton fired, and hit him a mortal blow about the shoulder or back, for he instantly was checked, and my ball, which followed the same instant, threw him down. We two then discharged our whole artillery, which originally consisted of two double-barreled guns, loaded with slugs, and a pair of pistols. Most of them took effect, as we could discover by his wincing, for he was not above ten yards from us at any time, and at one moment, when the elephant chose to take fright and turn his head round away from the beast, running his haunches almost into the bush, not *five*. By this time William Fraser had come round, and discharged a few balls at the tiger, which lay looking at us, grinning and growling, his ears thrown back, but unable to stir. A pistol fired by me, shattered his lower jaw-bone; and immediately, as danger of approaching him was now over, one of the villagers with a matchlock went close to him, and applying the muzzle of his piece to the nape of his neck, shot him dead, and put him out of his pain. The people then dragged him out, and we dismounted to look at him, pierced through and through; yet one could not contemplate him without satisfaction, as we were told that he had long infested the high road, and carried off many passengers. One hears of the *roar* of a tiger, and fancies it like that of a bull; but in fact it is more like the grunt of a hog, though twenty times louder, and certainly one of the most tremendous animal noises one can imagine."

Captain Mundy gives us the following spirited description of a tiger-hunt in which he was engaged. The parties found immense quantities of game, wild hogs, hog-deer, and the neilghi: they however strictly abstained from firing, reserving their whole battery for the nobler game of which they were in pursuit. They had to pass through a thick forest, and the narrator gives a

very interesting description of the power and dexterity of the elephants in overthrowing trees to make a road:

"On clearing the wood," he says, "we entered an open space of marshy grass not three feet high; a large herd of cattle were feeding there, and the herdsman was sitting singing under a bush, when, just as the former began to move before us, up sprang the very tiger for whom our visit was intended, and cantered off across a bare plain dotted with small patches of bush-jungle. He took to the open country in a style which would have more become a fox than a tiger, who is expected by his pursuers to fight and not to run, and as he was flushed on the flank of the line only one bullet was fired at him ere he cleared the thick grass. He was unhurt; and we pursued him at full speed. Twice he threw us out by stopping short in small strips of jungle, and then heading back after we had passed; and he had given us a very fast trot of about two miles when Colonel Arnold, who led the field, at last reached him by a capital shot, his elephant being in full career.

"As soon as he felt himself wounded, the tiger crept into a close thicket of trees and bushes, and crouched. The two leading sportsmen overran the place where he lay, and as I came up I saw him through an aperture rising to attempt a charge. My mahout had just before, in the heat of the chase, dropped his ankors, or goad, which I had refused to allow him to recover, and the elephant being notoriously savage, and further irritated by the goading he had undergone, became consequently unmanageable; he appeared to see the tiger as soon as myself, and I had only time to fire one shot when he suddenly rushed with the greatest fury into the thicket, and falling upon his knees nailed the tiger with his tusks to the ground. Such was the violence of the shock that my servant, who sat behind, was thrown out, and one of my guns went overboard. The struggles of my elephant to crush his still resisting foe, who had fixed one paw on his eye, were so energetic that I was obliged to hold on with all my strength to keep myself in the houdah. The second barrel, too, of the gun, which I still retained in my hand, went off in the scuffle, the ball passing close to the mahout's ear, whose situation, poor fellow, was any thing but enviable. As soon as my elephant was prevailed upon to leave the killing part of the business to the sportsmen, they gave the roughly used tiger the *coup-de-grace*. It was a very fine female, with the most beautiful skin I ever saw."

An English gentleman who was present, gives the following account of a hunting-party of the Nawab Asuf-ud-Dowlah. After describing the immense cavalcade of the nawab, he says:

"The first tiger we saw and killed was in the mountains. We went to attack him about noon; he was in a narrow valley, which the nawab surrounded with about two hundred elephants; we heard him growl horribly in a thick bush in the middle of the valley. Being accustomed to the sport, and very eager, I pushed in my elephant; the fierce beast charged me immediately; the elephant, a timid animal, turned tail, and deprived me of the opportunity to fire. I ventured again, attended by two or three other elephants; the tiger made a spring, and nearly reached the back of one of the elephants on which were three or four men; the elephant shook himself so forcibly as to throw these men off his back, and they tumbled into the bush; I gave them up for lost, but was agreeably surprised to see them creep out unhurt. His excellency was all this time on a rising ground near the thicket, looking on calmly, and beckoning to me to drive the tiger toward him. I made another attempt, and with more success; he darted out toward me on my approach, roaring furiously and lashing his sides with his tail. I luckily got a shot and hit him; he retreated into the bush, and ten or twelve elephants just then pushed into the thicket, alarmed the tiger, and obliged him to run toward the nawab, who instantly gave him a warm reception, and with the assistance of some of his omras, or lords, laid the tiger sprawling on his side. A loud shout of 'Wha! wha!' proclaimed the victory."

This is hunting on a grand scale, but it is altogether insignificant in comparison with the hunts of the Chinese emperors in their Tartar provinces. These serve to exercise the troops in winter, and are of great antiquity. They were practiced by Genghis Khan, and are still continued. The emperor commands the huntsmen to trace out a vast circle of perhaps thirty miles in circumference. The officers then station their troops, inclosing it around; the soldiers begin their march to the sound of martial music, and continue gradually to advance toward the centre, keep-

ing the ring unbroken, and thus driving before them the wild animals within the circle; but they are forbidden to kill or wound any of them, however ferocious they may be. They encamp every night, when all the martial manœuvres are punctually executed. The march lasts many weeks; the space lessens; and the creatures, finding themselves closely pressed, flee to the mountains and forests, whence they are soon dislodged by the hunters opening their dens and kennels with spades and mattocks, and even searching them out with ferrets.

As the narrowed ring brings the bewildered animals together, the strong, growing furious, devour the weak, and the air is rent with horrid howlings, yells, and screams of ferocity or agony. The soldiers are scarce able to drive the beasts forward by incessant shouts. At length, when they are pent into so small a space that they can all be seen, the drums, cymbals, and other music set up a deafening clangor. This, joined to the fierce cries of the hunters and soldiers, so terrifies and astonishes the beasts, that they lose all their ferocity; lions and tigers, bears, wolves, and wild boars, crouch subdued, and endeavor to skulk one behind the other.

The emperor, accompanied by his sons and chief officers, first enters the circle, holding his drawn saber and bow and arrows, and begins the terrific slaughter by striking the most savage of the animals. Many of these, at their last extremity, on being wounded, resume their ferocity, and struggle hard for their lives. The sovereign now retires to an eminence, where a throne has been raised, whence he views the fight, from which no one shrinks, however great the peril. When the princes and nobles have sufficiently displayed their prowess, the youths continue the carnage.

"What yet remain
Alive, with vain assault, contend to break
Th' impenetrable line. Others, whom fear
Unnerves, with self-preserving wiles, beneath
The bodies of the slain for shelter creep. * * *
When, lo! the bright sultanas of the court!—
Suppliant they bend, and humbly sue to save
The vanquish'd host. * * *
At beauty's high behest, the khan commands,—
Opening to right and left, the well-train'd troops
Leave a large void:—impetuous forth the foe
Fly frantic, on the wings of fear upborne."

The tiger has often been represented as untamable, but this is now known to be a mistake. Not only is it capable of being tamed, but instances have happened in which it has shown strong attachment to its keepers. A young tigress, brought to London and placed in the Tower Menagerie, had been, during her passage from Calcutta, allowed to range about the vessel unrestrained, and had become perfectly familiar with the sailors, showing not the slightest symptom of ferocity. On her arrival in the Thames the irritation produced by the sight of strangers instantly changed her temper, rendering her irascible and dangerous. So sulky and savage was she, that Mr. Cops, who then kept the lions in the Tower, could hardly be prevailed on by her former keeper, who came to see her, to allow him to enter her den; but as soon as the tigress recognized her old friend, she fawned on him, licked him, caressed him, and manifested the most extravagant signs of pleasure; and when at last he left her, she cried and whined for the remainder of the day. The tame tigers of the mendicant priests, or fakirs, of Hindostan are well known. But while there can be no doubt of the tamable qualities of the tiger, and indeed of all the great cats, they are not to be incautiously trusted. The natural disposition is always ready to break out; and the mildest of them, though

——"Ne'er so tame, so cherish'd, and lock'd up,
Will have a wild trick of his ancestors."

It is a curious fact that the lion and tigress, in confinement, will breed together: this has twice happened in England. The young ones appeared more like tigers than lions. In both cases they died young. The fundamental character of man is well illustrated in the emblems he uses to express his will.

In the East the tiger is the favorite type of royalty, and royalty is the representative of God on earth. In old Rome the eagle was placed upon the national banners; in modern Chris-

tian England, the lion is the presiding genius of the national insignia. Such are the types of despotism: and republican America has followed the example. When it was proposed in Congress that the beaver, or some peaceful and worthy animal should be placed upon our national crest, the suggestion was laughed to scorn. Nothing could content that innate worship of might without respect to right, which belongs to men of all times and all climes, but the great feathered thief, robber, butcher, and scavenger—the *Bald-Headed Eagle!*



THE LEOPARD.

The Leopard, *Felis leopardus*, is about half the size of the tiger, being two feet high and four long, and is distinguished alike for the elegance of its form, the grace of its movements, and the beauty of its skin. The latter is of a pale yellow color, marked with small tawny spots, united in circular or quadrangular or triangular groups, these groups being arranged nearly in rows, and covering the whole body. The habits of these animals in a state of nature are little known. They are very active, and climb with such facility as to be called *Tree-Tigers* by the natives. Nothing can be more beautiful than the elegant and active manner in which the leopards sport among the branches of the trees: at one time they will bound from branch to branch with such rapidity that the eye can scarcely follow them; then, as if tired, they will suddenly stretch themselves along a branch, so as to be hardly distinguishable from the bark, but start up again on the slightest provocation, and again resume their graceful antics. They feed on antelopes, deer, and especially monkeys, which abound in the countries where the leopard is found. Those that dwell near the settlements of man make sad havoc among the sheep and pigs. It is said that when pressed by hunger they will attack a man by stealing upon him from behind. The leopard is easily tamed, and expresses great fondness for its keeper, and will play with him like a cat, although it cannot be fully trusted. A remarkably beautiful one in an English menagerie was exceedingly fond of playing with the tuft at the extremity of a lion's tail, and from the familiar manner in which he patted and bit it, he evidently considered it as manufactured for his own particular entertainment.

Some years ago Mrs. Bowditch brought a tame leopard over with her to England from Africa. This animal was called Saï. One day, at Cape Coast Castle, he found the servant appointed to attend on him, sitting asleep, resting his back against a door; Saï instantly lifted up his paw, and gave the sleeper a tap on the side of the cheek, which knocked him over, and when the man awoke he found Saï wagging his tail and seeming to enjoy the fun. Another day, when a woman was scrubbing the floor, he jumped on her back; and when the woman screamed with fright, he sprang off, and began rolling over and over like a kitten. When put on board ship, he was at first confined in a cage; and the greatest pleasure he had was when Mrs. Bowditch gave him a little twisted cup or cornet of stiff paper with some lavender-water in it, and with this he

was so delighted, that he would roll himself over and over, and rub his paws against his face. At first he used to put his claws out when he attempted to snatch any thing; but as Mrs. Bowditch would never give him any lavender-water when this was the case, he soon learned to keep his claws in.



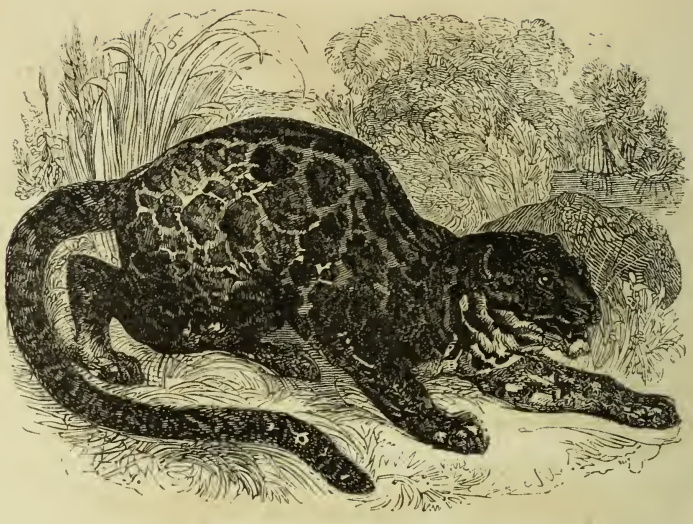
THE PANTHER.

The Panther, *F. pardus*, greatly resembles the leopard, and by most naturalists the two animals are considered as of the same species. It is said, however, that the ground-color of the panther is a shade darker than that of the leopard; its spots also are larger, and the inner edges of the rings of spots are of a darker hue. It would appear that the habits of the two animals are similar, and that both inhabit Africa and Asia—the leopard being most common in the former and the panther in the latter.

The Ounce, *F. uncia*, resembles the panther in size and habits, but its form is somewhat lower and stouter, the tail longer and thicker, the ground-color paler, the spots larger and more irregular, and the fur much thicker. It is a native of India.

Among the larger spotted cats of the Old World is the Riman-Dihan, *F. macrocelis*. It is four feet long, and one foot ten inches high; the color, whitish ashy gray, with dark irregular stripes and spots over the body; the limbs stout; the feet and claws robust and strong; tail long, large, and lanuginous. It is a native of Sumatra, and is rather a rare animal. It feeds on poultry, birds, small quadrupeds, and deer.

Sir Stamford Raffles gives the following description of two specimens, one of which he carried to England: "While in a state of confinement they were remarkable for good-temper and playfulness; no domestic kitten could be more so; they were always courting intercourse with persons passing by, and in the expression of their countenance, which was always open and smiling, showed the greatest delight when noticed, throwing themselves on their backs, and delighting in being tickled and rubbed. * * * * On board the ship there was a small



THE RIMAN-DIHAN.

dog, who used to play round the cage and with the animal, and it was amusing to observe the playfulness and tenderness with which the latter came in contact with his inferior-sized companion. When fed with a fowl that died, he seized the prey, and after sucking the blood and tearing it a little, he amused himself for hours in throwing it about and jumping after it in the manner that a cat plays with a mouse before it is quite dead. He never seemed to look on man or children as prey, but as companions: the natives assert that when wild, these creatures live principally on poultry, birds, and the smaller kinds of deer. They are not numerous, and may be considered rather rare animals, even in the southern part of Sumatra. Both specimens were procured from the interior of Bencoolen, on the banks of the Bencoolen River. They are generally found in the vicinity of villages, and are not dreaded by the natives, except as far as they may destroy the poultry. The natives assert that they sleep and often lie in wait for their prey on trees; and from this circumstance they derive the name of *Dihan*, which signifies the fork formed by the branch of a tree, across which they are said to rest and occasionally to stretch themselves. Both specimens constantly amused themselves in frequently jumping and clinging to the top of their cage, and throwing a somerset, or twisting themselves round in the manner of a squirrel when confined, the tail being extended, and showing to great advantage when so expanded."

Leaving for the present the American *Jaguar* and *Puma* which rank with the leopard and panther in size, and would naturally come in here, we must now notice various foreign species of the cat family, which are intermediate between these powerful brutes and the smaller kinds. The Serval, *F. serval*, of Africa, has a skin of a yellowish color, marked with black spots; the tail has eight black rings; length of the body two feet, height one foot. A young one in the Zoological Gardens was mild, gentle, and exceedingly sportive, playing with its tail and rolling small objects about on the floor like a kitten. It is a native of Southern Africa.

The Caffre Cat, *F. Caffra*, is about two feet long; its tail is long and bushy; its ground-color of a grayish brown zebraed with black. It is extremely elegant in its form and its markings. It is found in Caffraria and parts of Southern Africa, living in the flats covered with long grass and low underwood, and feeding upon small quadrupeds and birds.

The Nepaul Tiger-Cat, *F. Nepalensis*, has a ground-color of grayish brown, with longitudinal bands and spots of deep black. It is of the size of the preceding, but more slender of form, and with the tail longer. It appears to be of a wild and savage nature.

The Kubouk, *F. Javanensis*, found in Java; the Marbled Cat, *F. marmorata*, of Malacca; the Mirvini, *F. Moormensis*, from the Moormi Hills of Nepaul; the Wagati Cat, *F. viverrina*, of India; the Balu, *F. Sumatrana*, of Sumatra; the Maou, *F. Chinensis*, of China; Warwick's



THE CAFFRE CAT.

Cat, *F. Himalayana*, of India; and the Waved Cat, *F. torquata*, also of India, appear, all, to bear a resemblance to the Nepaul tiger-cat: they are, however, little known.



THE LYNX.

We now come to the Lynxes, of which there are several species. The common European Lynx, *F. lynx*, has long fur, of a dull reddish gray above, with oblong spots of reddish gray upon the sides, the spots on the limbs rounder and smaller; whitish below, mottled with black. Length about three feet. This species varies much. In winter the fur is much longer than it is in the summer, and has a hoary appearance in the former season, owing to the long hair being then tipped with grayish white. The tail, which is black at the end, is short, not more than six or seven inches long. It feeds on small quadrupeds and birds, in quest of which it climbs trees with ease and activity. In case of need, it will eat carrion and the carcasses of animals slain by

the larger carnivora. Its keenness of sight has become proverbial; the ancients imagined that it could even penetrate opaque substances. Its fur is valuable, and immense numbers of its skins are annually brought to the various markets of the world. There appear to be several varieties of this species in Northern Europe and Northern Asia, which pass under different names, and are supposed by some to be distinct species.

The Booted Lynx, *F. caligata*, is rather smaller than the preceding; the ears are large, and tipped with a pencil of short brown hairs. The upper parts of the body are a bluish gray, sometimes having a fulvous tinge; the lower parts are reddish. The tail has three or four incomplete rings toward the tip. Its habits of feeding are the same as the preceding. It is a native of Africa and the south of India.

The Chaus, or Marsh Lynx, *F. chaus*, has a general resemblance to the other lynxes: it is found in the north of Africa, and in the morasses and bushy lowlands that border the Caspian Sea, as well as the banks of the tributary rivers. It is said to be numerous in Persia, and has been noticed in the Deccan. This species haunts marshes and boggy regions, and goes hunting, during the night, after birds, small rodents, and fishes; it seldom climbs trees, and is not easily tamed. The Smaller Chaus, *F. pulchella*, is found in Egypt; the Servaline Chaus, *F. servalinas*, in India.



THE CARACAL.

The Caracal, or Siyah Ghush, *F. Caracal*, is supposed by some to be the lynx of the ancients. It is somewhat larger than the fox, the upper surface of the body being a uniform deep brown; the ears long, upright, and tapering to a fine point, surmounted by a pencil of long black hairs. It is found in all the eastern portion of Africa and the southern half of Asia. It is said to follow the lion and other large beasts of prey, most probably for the purpose of feeding upon what they leave. But, in addition to this, it feeds on small quadrupeds and birds, the latter of which it is said to pursue actively on trees. It has obtained the name of "lion's provider," most probably from its dogging the footsteps of the lion, and having been found preying on what he has left. We are told that the caracals hunt in packs, and run down their prey like wild dogs. A young one in the Zoological Gardens was familiar, and pleased to be noticed; the old ones, in their native state, are ferocious and powerful.

The Flat-headed Lynx, *F. planiceps*, of Sumatra, is little known.

The Domestic Cat, *F. Catus; Chat*, in French; *Gatto*, in Italian; *Gato*, in Spanish; *Katze*, in German.—The domestic cat, like the domestic dog, has been the companion of man from the earliest periods of history; it is the only one of the cat family that has been generally used in the economy of home. Egypt had its domestic cats, where they were embalmed, and their remains are still found; probably that country was the first to domesticate these animals. In nearly all European countries, the name of the cat is derived from the Latin, which renders it likely that Northern and Western Europe received this domestic animal through Roman civilization. As is the case with other domesticated animals—although the wild ones are nearly all alike in size, form, and color—the tame ones are black, white, gray, mottled, and variegated, in endless diversity. There are also particular breeds, some of which have attained celebrity, as the *Angora Cat*, a large, fine kind, gentle and delicate, with fine silvery hair; the *Maltese Cat*, of a mouse-color, and distinguished as a good mouser; the *Tabby Cat*, which resembles the wild breed; and the *Tortoise-shell Cat*, supposed to have originated in Spain, and beautifully marked with white, black, and orange colors, and noted for its activity and its grateful attachment to its keeper. The females are generally pure tortoise-shell, while the males are buff, with stripes of a darker hue. The *Persian Cat* is of a glossy gray, with the fur long, and soft as silk; the *Chinese Cat* is beautifully glossed, and variegated with black and yellow. The *Chartreuse Cat* is of a white or whitish color, with a blue tinge, the eyelids being red. The *Manx* or *Tailless Cat*, of Cornwall, in England, and the Isle of Man, are of this breed. In our country, the breeds of cats are little attended to. In France, the people generally are cat-fanciers, and many beautiful specimens are to be seen there.

The habits of cats are familiar to all: their light, noiseless tread; their easy, graceful movements; their sly, stealthy approach, when seeking to catch a mouse or a bird; the patience with which they watch for it,—the sudden, murderous bound, with which they seize it! Everybody has seen the pride with which they parade their just-caught game before the household; the levity with which they torment a poor, frighted, dying mouse. What can exceed the soft, seductive grace with which puss smiles and fawns upon you, when she is pleased! how gentle is her pur, how velvety her paw, at such a time as this! What can be more hideous than her whole aspect when she is angry,—her teeth displayed, her claws protruded, her back arched, her tail aloft, her hair standing out in all directions, while she spits like a tobacco-chewer leveling his battery at the carpets of the Astor House or the St. Nicholas! What spectacle is there in nature more pleasing than a family of kittens at their play?

What is more amusing than to watch a young cat when it first sees itself in a mirror? Half curious and half playful, it begins by pawing at the image; then it peers slily around the edge of the glass, but returns disappointed. Again observing the reflection, it renews its attempts. This is several times repeated, until at last the little creature puts itself in various attitudes to observe the effect. After a time it ceases to attempt to catch or play with the image, but still seems fond of seeing itself in a glass.

Cats are fond of certain odors, as those of catmint and valerian, rolling themselves in a kind of ecstasy when they smell the latter plant. They spend much time in stroking their faces with their paws, as if washing themselves. Notwithstanding their seeming gentleness, they have savage fights with each other, and tear the skin off each other's necks.

The pupil of a cat's eye, in the light, appears to be only a vertical line or slit: in the dark it becomes round. The glistening of a cat's eyes in a dim light, has been supposed to be owing to a phosphoric emanation; it is, however, only the reflection of the light from the cornean membrane of the eye. The electricity noticed on the back of the animal probably belongs to the hair of all the feline race, and is conjectured to be in some way—not yet explained—connected with their natural excitability.

The cat possesses the instinct of catching and eating mice, and the mouse that of shunning the cat as its most dangerous enemy. Once, a gentleman in Rome happened to open a drawer he seldom had occasion to use, when he saw a mouse jumping out of it, and found among the papers a nest with five young mice, naked and blind, and of a pale flesh-color. He placed them on a table, handled them, &c., and they evinced no symptoms of fright, nor any inclination to get away, but only appeared eager to approach each other for the sake of warmth. There happened to be

in the house a very young cat who had never tasted any thing but milk. He placed it near the little mice by way of experiment; but, to his astonishment, it did not even look at them, nor perceive them, even when he turned its eyes in the proper direction, until at last, when he had repeatedly approached its nose to the mice, it suddenly caught a scent, whereupon it began to tremble with desire. The propensity became more and more violent, and the cat smelled at the mice, touching them with its nose, when all at once the pale-colored little creatures became suffused with blood, and began to make great exertions to get out of the way of danger, while the cat as eagerly followed them.

The cat displays a great affection for her kittens, and her pride when they first run about is quite amusing. "While I was an undergraduate at college," says Wood, "a cat belonging to the baker's department formed a great friendship for me, and used to come every morning and evening to obtain her share of breakfast and tea. She continued her attentions for some time, but, one morning she was absent from her accustomed corner, nor did she return until nearly a week had passed, when she came again, but always seemed uneasy unless the door was open. A few days afterward she came up as usual, and jumped upon my knee, at the same time putting a little kitten into my hand. She refused to take it back again, so I restored it to its brothers and sisters myself. Soon afterward, on going into my bedroom, I found another kitten fast asleep on my bed."

The instinct of the cat teaches her to become familiar with places. When she is taken to a new room, she carefully examines every article by looking at it and smelling of it: she crawls into every hole, closet, and cupboard; creeps under the beds, measures with her feelers every passage, and having taken this survey, probably never forgets its details. The attachment of cats to places, which is instinctive and necessary, is supposed to exclude attachment to persons: instances of personal love and friendship are, however, by no means uncommon. A gentleman in the neighborhood of London had a tortoise-shell cat which, though he never fed it, or paid much attention to it, formed an attachment for him equal to that of any dog. It knew his ring at the bell, and, at whatever time he came home, it was rubbing against his legs long before the servant came, saw him into the sitting-room, and then walked off. It was a very active animal, and usually went bird-catching during the night; but, when its master arose, which was generally early in the morning, the cat was always ready to receive him at the door of his room, and accompanied him in his morning walk in the garden, alternately skipping to the tops of the trees, and descending and gamboling about him. When he was in his study, it used to pay him several visits in the day, always short ones, but it never retired till he had recognized it. If rubbing against his legs had not the desired effect, it would mount the writing-table, nudge his shoulder, and, if that would not do, pat him on the cheek; but the moment that he had shaken it by the paw and given it a pat or two on the head, it walked off. When he was indisposed, it paid him several visits every day, but never continued in the room; and, although it was fond of society generally, and also of its food, it never obtruded its company during meals, thus showing that its attachment was personal and disinterested.

For centuries cats have been connected with ideas of superstition and sorcery. They have always been regarded as attendants upon witches; and witches themselves have been said to borrow their shapes when on their mysterious expeditions. Lord Cochrane was accompanied by a favorite black cat in a cruise through the northern seas. The weather had been most unpropitious; no day had passed without some untoward circumstance, and the sailors were not slow in attributing the whole to the influence of the black cat on board. This came to Lord Cochrane's ears; and, knowing that any attempt to reason his men out of so absurd a notion was perfectly useless, he offered to sacrifice this object of his regard, and have her thrown overboard. This, however, far from creating any satisfaction, only alarmed the men still more; they were sure that the tempests she would then raise would be much worse than any they had yet encountered; and they implored his lordship to let her remain unmolested. "There was no help, and they could only hope, if she were not affronted, they might, at the end of their time, reach England in safety."

Black cats were always more especially connected with superstitious feelings. Mrs. Lee says that she was once accosted by a peasant's wife, who, with a vial in her hand to contain it, requested



ANGORA CATS.

that she would give her a few drops of blood from the tail of her black kitten, not only to bring luck to her hearth, but to keep pestilence from her doors. A working woman told her once, not to turn a stray black cat from her house; for, if she did, she would never have any prosperity afterward. Captain Brown tells us that on Hallowe'en, it was usual in Scotland for families to tie up their cat, in order to preserve it from being used as a pony by the witches that night. Those who neglected this precaution, ran the risk of seeing their cat scampering through the fields, with a witch on its back, on the high road to Norway. A black cat was commonly sacrificed by the ancients to Hecate, or among the Scandinavians to Frea, the northern Hecate. A black cat, sent with a prayer-book and a bag of sand into a new house, so as to precede the proprietor in possession, was formerly deemed essential to insure prosperity to the person changing his abode. To steal a black cat and bury it alive, is, in the Irish Highlands, considered as a specific for a disorder in cattle, termed "blacklegs," which otherwise proves fatal.

Another very curious thing is, that while most persons are pleased with cats, others have an instinctive and uncontrollable aversion toward them. What is still more remarkable is this, that those persons entertaining this dislike can instantly tell that a cat is in a room, even though it is out of sight. An instance of this kind is thus related in regard to Rev. Dr. B———:

He had a horror of cats and kittens, and such was its intensity as to endow him with clairvoyance, so that he could easily detect one of these creatures in the room, though it might be out of sight, or even confined in a closet. Frequent attempts were made to deceive him, but without success. His instinct was infallible. When he was seen coming, the first thing attended to was to shut up the whole purring family, and they were kept under lock and key till the good doctor had departed. Once upon a time, while dining with a friend, he suddenly threw down his knife and fork, his face being pale with horror.

"What is the matter?" ejaculated his host in great excitement.

"It is a cat," said the doctor, in a hollow voice.

"A cat!" was the thrilling reply. "Impossible; we were particular to shut up the cat and kittens as soon as you came."

"I say, there's a cat in the room," said the doctor, with fearful emphasis.

A hurry-scurry ensued, and after a long search a kitten was found slumbering in the cradle, under the clothing, and snugged down beside the baby!

The evening serenades of cats, called *caterwaulings*, in towns and cities, are notorious; they are supposed to be courtings, but are usually attended with a good deal of biting and scratching. At all events, they are rather annoying. The humors of a late Scottish judge, Lord Eldin, are worth repeating in this connection: "He kept a numerous company of cats, to whose general accommodation he devoted a large apartment, and had them duly fed and attended, endeavoring to make them a happy as well as an orderly society. Civil wars were, however, constantly breaking out among them, to the disturbance of the neighborhood; and at last they became so noisy, that, at a late hour one evening, he went in person to enforce the necessity of observing the king's peace, even on the part of his quadruped subjects. The Toms and Tabbies, for the whole colony were up in arms, paid not the least attention to the presence or admonition of the learned gentleman. He retired, sent for his clerk, and desired him to fetch the riot act from the library. This being obtained, the two proceeded to the territory of the conflicting cats, the clerk with the riot act, and the barrister—which Eldin then was—with a horsewhip. After proclamation duly made, the riot act was read with the necessary solemnity, and the cats warned of the consequences if they did not return to an orderly deportment before the expiry of the statutable time. That time passed without any abatement of the riot, upon which the governor bolted the door, and bestowed on them a hearty discipline with the whip."

The Wild-Cat, *Felis catus ferus*.—We have thus far been speaking of the cat in her tamed and civilized condition; we must now speak of her in her savage state. There are many kinds of wild-cat, some of which we have already noticed, but that from which the domestic cat is supposed to have sprung is called the *Common European Wild-Cat*, and is found in most parts of that quarter of the globe, as well as in Asia and Africa; it is also sometimes met with in this country. When America was first discovered, this species, either tame or wild, was not found



THE WILD-CAT.

here; all our domestic cats, as well as the wild ones occasionally found in the woods, are the descendants of those brought hither by the Europeans.

The wild-cats of the European continent are either the descendants of the original races that have continued untamed from the beginning, or of domesticated cats that have wandered from their homes, and, living apart from man, have relapsed into barbarism. It is said that the wild and tame cats, in their wanderings, sometimes meet; when this is the case, the females of the tame breed are well treated by the savage cats, but the males are rudely set upon and sometimes torn in pieces. The wild and tame cats sometimes breed together, and produce the kind called *Tiger-Cats*. Some authors hold that the wild-cat is a distinct species, because its tail is shorter and more bushy than that of the domestic cat; but this opinion seems not well founded, for still greater differences are found in dogs which are acknowledged to be of the same race.

The wild-cat is rather larger and more robust than the tame breed; the head is triangular, and has a savage aspect, especially when the animal is irritated; the fur is long, soft, and thick; the back, sides, and limbs are gray, darker on the back and paler below, with a blackish longitudinal stripe along the middle of the back, and numerous paler curved ones on the sides. The tail is annulated with light gray and black, the tip of the latter color. As is the case with some other animals—the ox, dog, and horse, for instance—so it is with the cats. The wild ones are nearly all of the same hue, while the domestic ones, as we have already stated, are white, black, gray, and yellow, and of various mingled shades and colors.

The wild-cat is a very shy animal, chiefly nocturnal in its habits. It lurks in woods and thickets, and preys on hares, squirrels, and birds of various kinds. Some four or five hundred years ago it was common in England, and was a beast of chase like the fox and the hare; it is now nearly extirpated. It is common in France, Germany, Russia, Hungary, and some other parts of Europe.

There is a variety of this animal which we must not omit to mention: this is the Egyptian Cat, *F. maniculata*. It is found in a wild state in Nubia, and is said to be somewhat smaller than the European wild-cat; the ground fur or hair is of a brownish yellow, dark above and pale below. The tail is slender, with two dark rings at its point. This is conjectured to be a distinct species, and of that kind domesticated in Egypt, and traced on the monuments and found in the cat-mummies. We see no necessity of adopting this opinion. It may be, indeed, a descendant of this breed, for there seems to be no animal that so soon loses its cultivation, and returns to a wild state. A trifling neglect of proper feeding or attention will often cause them to depend upon their own resources; and the tasting of some wild and living food will tempt them to seek it again, and to leave their civilized home. They then prowl about in the same manner as their

congeners, crouching among covers, and carefully concealing themselves from all publicity. They breed in the woods or thickets, and support themselves upon birds or young animals. Sir W. Jardin says, that "few extensive rabbit-warrens want two or three depredators of this kind, where they commit great havoc, particularly among the young in summer. They sleep and repose in the holes, and are often taken in the snares set for their prey. I once came upon a cat which had thus left her home: she had newly kittened in the ridge of an uncut corn-field. Upon approaching, she showed every disposition to defend her progeny, and beside her lay dead two half-grown leverets." These Egyptian cats may therefore be the degenerate offspring of the civilized cats which figure so largely in the early history of Egypt, and whatever difference there may be between those and the other varieties, can be accounted for by the influence of climate and condition. There is doubtless a tendency in the wild races of animals of the same species to uniformity of color and structure, but still we see permanent varieties in the wild dogs of Asia—as, for instance, the cuon and pariah; we therefore do not find it necessary to reject the possibility of similar permanent varieties in cats.



THE JAGUAR.

We shall now notice the American felidæ. The most formidable of these animals is the Jaguar, *Felis onça*. Its length is four to five feet; the tail two feet; the height two feet; the ground-color of the body is yellow, marked with open black figures of a roundish form; in each of these there is one or more small black spots. The marks are arranged in longitudinal lines, nearly parallel, along the body. The belly is almost white. The effect of the whole is in the highest degree brilliant and beautiful. It appears, however, that there is considerable variety in the shades of the colors and in the markings. The head of the animal is large, and the jaws have great power of expansion. The general form is robust, and has a somewhat heavy but still

powerful appearance. This animal is larger and stouter in his structure than the leopard and panther, and is about three fourths the size of the tiger. It has much of the fierceness and daring of the latter animal, and is hence often called the *American Tiger*. There is a variety, which appears to be quite rare, in which the ground-color is nearly black, the spots, however, being dimly visible; this is called the *Black Tiger*.

The jaguar is found in Texas and Mexico, and thence southward to the Argentine Republic. It is most common, and appears to attain its greatest size and ferocity, in the tropical countries. In the deep impenetrable swamps and thickets which abound in those regions, amid thorny shrubs and tangled vines, these animals abound, feeding on the monkeys, peccaries, and other quadrupeds that come within their reach. Many of them emerge from their haunts, especially at night, and make prey of deer, horses, and cattle. The colts and calves are their favorite prey, but they sometimes kill and drag off horses and full-grown cattle. A jaguar has been known to kill an ox yoked to another, and, carrying off the dead one, has compelled his companion to follow. Frequently two jaguars will combine to master the larger and more powerful brutes. Some of them lie in wait around the salt-licks and attack the animals that resort to these places. Their habit is to conceal themselves behind some bush, or on the trunk of a fallen tree; here they will lie, silent and motionless, for hours, patiently waiting for their victims. When they see a deer, or a mule, or mustang approaching, the eyes dilate, the hair rises along the back, the tail moves to and fro, and every limb quivers. When the unsuspecting prey comes within his reach, the monster bounds like a thunderbolt upon him. He fixes his teeth in his neck and his claws in the loins, and though the dismayed and aggravated victim flies, and rears, and essays to throw off his terrible rider, it is all in vain. His strength is soon exhausted, and he sinks to the earth an easy prey to his destroyer. The jaguar, growling and roaring in triumph, already tears his flesh while yet the agonies of death are upon him. When his hunger is appeased he covers the remains of the carcass with leaves, sticks, and earth, to protect them from the vultures; and either remains watching near at hand or retires for a time till appetite revives, when he returns to complete his carnival. An instance is related in which a jaguar was found, by a party of rangers, watching the carcass of a horse which he had killed and partially devoured, eight or ten famished wolves being around, yet not daring to take part in the feast. The rangers approached, and when the jaguar fled, they followed in pursuit. The wolves set up a cry like hounds, and joined in the chase. The jaguar was soon shot, and the wolves went back and devoured the remains of the horse.

The jaguar is peculiarly sly and stealthy in approaching his prey. He has also the habit of following for a long time the object of his desire. He does not often openly attack a man; and, indeed, he generally slinks away from him if boldly confronted. He will, however, frequently follow a traveler, keeping at a distance and out of sight, till an opportunity offers for springing upon him from behind. In South America, the instances in which these ferocious creatures have carried off children, and even men and women, are by no means rare.

When Mr. Waterton was encamped on the banks of the Essequibo, he was visited by one of these prowlers. In his "Wanderings," he says: "Whenever the fire got low the jaguar came a little nearer, and when the Indian renewed it, he retired abruptly; sometimes he would come within twenty yards, and then we had a view of him, sitting on his hind-legs like a dog; sometimes he moved slowly to and fro; and at other times we could hear him mend his pace, as if impatient. At last the Indian, not relishing the idea of having such company, set up a most tremendous yell. The jaguar bounded off like a race-horse, and returned no more. It appeared by the print of his feet next morning that he was a full-grown one."

The jaguar generally roams about alone, but sometimes he is seen in company with the female. The latter produces two at a birth. These are rough and woolly in appearance, till they are nearly full grown. The mother takes them abroad with her when they are of some size; like the rest of her family, she is devoted to her offspring, and will face any danger in their defense.

The jaguar is a most expert climber. Sonnini tells us that he saw the scratches left by the claws of one on the smooth bark of a tree, some forty feet high, without branches. He traced the marks of several slips made by the climber, but the animal had at last reached the top. Hum-

boldt heard the jaguar's yell from the tops of the trees, followed by the sharp, shrill, long whistle of the terrified monkeys, as they seemed to flee. None of the living quadrupeds appear to come amiss to it, and birds and fish, which last it captures in the shallows, are sacrificed to its voracious appetite. It is said to secure them, by proceeding into the edge of the water, where it drops its spittle on the surface; when the fish approach to seize it, he knocks them out upon the shore with his paw. Though generally so sly in their habits, the jaguars frequently carry off cattle, horses, and sheep from the inclosures of the plantations, and the havoc made by them is very great. Nor are the reptiles free from its attacks. The shells of turtles were pointed out to Humboldt as having been emptied of their contents by the jaguar, which, it seems, watches them as they come to the sandy beeches to lay their eggs, rushes on them, and turns them on their backs. He then insinuates his paw between the shells, and scoops out the contents as clean as if a surgeon's knife had been employed. As the beast turns many more than he can devour at one meal, the Indians often profit by his dexterous cunning. He will, it is stated, pursue this persecuted race into the water where it is not very deep; he will also dig up and devour the eggs.

Sometimes this formidable creature seems to forget his habitual ferocity. Captain Andrews tells us of a jaguar that was set upon by the dogs of some hunters, which for some time would not fight, but played with these animals in the best possible temper. He was not moved from his sportive humor till he was shot in the shoulder. Humboldt relates a story of two Indian children, a girl and a boy, the one about seven and the other nine years old, who were at play on the outskirts of a village, about two o'clock in the afternoon, when a large jaguar came out of the woods bounding toward them playfully, his head down and his back arched, like a cat. He approached the boy, who was not sensible of his danger, and began to play with him, till at last the jaguar hit him so hard on the head with his paw as to draw blood, whereupon the little girl struck him smartly with a small switch, and he was bounding back not at all irritated, when the Indians, alarmed by the cries of the girl, came up.

The jaguar is said to make its attacks on quadrupeds by springing upon the neck of his prey; then placing one of his paws upon the back of its head, while he turns round the muzzle with the other, he dislocates the neck and deprives it of life. In his turn he falls a victim to man in many ways. Sometimes he is driven by dogs "to tree," in which case he is dispatched with the musket or lance; sometimes the pack force him among the bushes, and then often is exhibited a daring feat. A single Indian, with his left arm enveloped in a sheep-skin, and with a five-feet lance in his right, goes boldly in to him. The hunter parries the onset of the furious beast with his shielded arm, and at the same time deals him such a thrust with his lance as seldom requires repetition. The lasso is also used with the best effect upon the plains. The object of this war upon the jaguar is often to destroy a dangerous and destructive enemy; the value of the skin is also an inducement to the chase. This is much used by the Mexicans for saddle-cloths and holster-coverings. Many thousands are annually exported to Europe, where they are in great request for various purposes.

Notwithstanding the courage and ferocity of the jaguar, instances have happened in which it has been completely cowed and humbled by the convulsions of nature. We are told of a party of travelers among the mountains of South America who fled to a cave during a terrific thunder-storm. While here, a jaguar, seeking shelter from the tempest which made the rocks tremble to their center, entered the cave. Instead of attacking, or even threatening the strangers, who had no doubt invaded his lair, the beast crept almost upon his belly around them, and slunk away amid the recesses of the cavern.

Similar instances have been related of the tiger. In the inundations which occasionally take place in India, the marshy plains along the rivers are often completely covered by the water. These regions are the abodes of numbers of ferocious beasts—tigers, leopards, and crocodiles, with serpents, snakes, and vultures—all usually preying upon each other. But when the waters sweep the land, numbers of these creatures may be seen together, in perfect harmony, taking shelter upon the limbs of some gigantic tree that lifts itself above the flood.

Malte-Brun gives us a similar picture in respect to Guiana. This country, he tells us, is subject to annual inundations during the rainy season; the rivers, swollen by continual rains, over-



INUNDATION IN GUIANA.

flow their banks; forests, trees, shrubs, and parasitical plants seem to float upon the water. Quadrupeds are forced to take shelter in the highest trees; large lizards, agoutis, and peccari quit their dens, now filled with water, and remain among the branches. Aquatic birds spring upon the trees, to avoid the alligators and serpents that infest the temporary lakes. The fishes forsake their ordinary food, and live upon the fruits and berries of the shrubs among which they swim: the crab is found upon the trees, and the oyster multiplies in the forest. The Indian, who surveys from his canoe this confusion of earth and sea, suspends his hammock on an elevated branch, and sleeps without fear in the midst of so great apparent danger.

From the account we have given, it might seem that the jaguar in South America holds unquestioned dominion over the animal creation, as does the lion in Africa and the tiger in India. It has, however, one enemy, living in its own haunts, which not unfrequently makes even this tyrant of the wilderness its prey. This is the boa constrictor. In the overgrown and swampy thickets of the tropical regions, these serpents, in many varieties—nursed by a perpetual summer, and pampered by an uninterrupted feast—multiply in almost countless millions, and grow to an enormous size. They lie couched amid the rank herbage that cumbers the earth, or wind among the trailing mosses that festoon the forests, or hang suspended from the boughs of the trees. Silent and motionless they watch the approach of their prey. Often the stealthy jaguar comes unconsciously within the reach of one of them, when, with the quickness of thought, it darts upon him, embraces him in its folds, and his bones cracking like fagots, he expires in the invincible grasp.

The Cougar, *Felis concolor*, has had the honor of bearing a great variety of names. Being, like the true lion, a ferocious beast, and nearly of a uniform color, it was originally called the *American Lion;* consequently certain European naturalists found conclusive proof in this animal to sustain a favorite theory that every thing American was on an inferior scale, when compared with similar products of nature in the Old World. Among the people of New England it was for-



THE BOA CONSTRICTOR CRUSHING THE JAGUAR.

merly called the *Panther*, and this was vulgarized into *Painter;* sometimes, too, it was called *Catamount.* Charlevoix described it under the name of *Carcajou*, which really belongs to the glutton. Azara called it *Gouazoura*, and the French gave it the name of *Cougar.* This, with the South American title of *Puma*, it still retains; it is also still called *Panther* in the United States. The form of this creature is long and slender, the legs short and stout, the head being rather small and carried high. The body is silvery fawn above, sometimes reddish, the tawny hairs of the upper parts being whitish at the tips; the belly and inside of the limbs are nearly white; the head black and gray, irregularly mixed. The length of the body is four to five feet, and sometimes even more. The female is colored like the male. Three to five young ones are produced at a birth; these are variously striped and spotted.

The cougar is the only formidable animal of the cat kind that is known in the United States. Formerly, it extended from Canada to Patagonia; but, in the more settled parts of our country, it is altogether extirpated or extremely rare. Fifty years ago, it was occasionally met with

in nearly all the wooded regions of New England. One is still sometimes seen in the northern wilds of Maine and New Hampshire. The author of these pages recollects that, in his boyhood, meeting a "painter" was among the possible adventures of a sportsman in the mountainous western border of Connecticut. At present this animal is rare in most parts of the Northern and Middle States: it is frequently met with in the Alleghany range, from New York to Georgia. It is fond of marshy lands, and is common in the swamps along the Southern rivers, and is especially abundant in Texas and Florida. It is found in Oregon and California, but more sparingly. Though it appears to be the only large animal of the cat family that lives and thrives in a temperate climate, the cougar still seems to find its true home in the hot regions of our continent. In Mexico, Central America, Colombia, Guiana, and Brazil, it reaches its largest size, and its predaceous qualities have their fullest development.

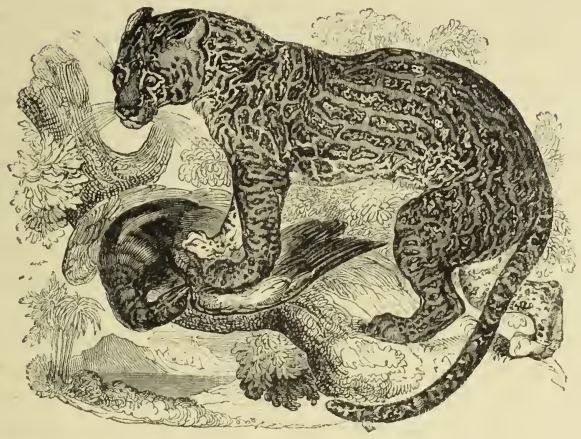
The cougar generally subsists on birds and small quadrupeds, such as young deer, raccoons, skunks, and the like: in South America the monkeys and peccaries frequently become its prey. In the vicinity of man it often makes sad havoc among the sheep: one has been known to kill fifty in a night, and gorge himself with their blood. It also kills great numbers of swine. Young animals, lambs, pigs, calves, and colts, are its especial favorites. If a cougar finds an unfortunate cow, or even a bullock, embarrassed in the oozy mud of a swamp, he will fall upon it and kill it. If the animal is too large for a single meal, the greedy brute, having filled himself to repletion, retires to a short distance, and waits and watches till his hunger revives, when he returns and finishes his gluttonous repast.

This animal is nocturnal in its habits, and is said to utter a wailing cry, which travelers represent as peculiarly wild, startling, and hideous, when heard in the wilderness, during the still watches of the night. It is conjectured, however, that the shrill bark of the fox, and the desolate hootings of the owl, are often mistaken for the yell of the cougar. This animal prowls about in search of its prey with great perseverance, and slily approaching its intended victim, bounds upon it with a sudden and terrible velocity. It is a peculiarly cowardly animal, and appears never to attack a man in open day, but sometimes at night it has sprung upon an unwary traveler either lagging along the road or encamped in the woods. Like all others of the cat family, it is afraid of fire, and the usual defense of woodmen is to keep up a blaze during the night. Even with this caution, a party of foresters has often been startled by finding their horses attacked, and sometimes cruelly lacerated by the claws and teeth of these blood-thirsty creatures. Innumerable instances of this kind have happened to emigrants and settlers in the Western States.

The cougar climbs trees with great facility; it often lies in wait for its prey on the limb of a tree, and when it comes within reach, descends upon it like a thunderbolt. In mountainous countries, its lair is in the clefts of the rocks; in marshy lands, it makes its rude bed of leaves, weeds, and grasses, in the thick, matted coverts of the jungle, the chapparal, or the cane-brake. The female cougar is most affectionate and devoted to her young. She only leaves them to procure necessary food, and permits them to subsist upon her till she is often reduced to a skeleton. When about half grown, they cease to be nursed, and accompany their parents—who usually go together—in their hunts.

It appears that there is an animal in South America which is called the Black Cougar, *Felis discolor*; but whether a distinct species or only a variety of the cougar, is not determined.

The Ocelot, or Leopard Cat, *Felis pardalis*, is found in Texas, Louisiana, and Mexico, and as far south as Paraguay. The length of the body is three feet, the height one foot six inches. The ground-color is gray, marked with fawn-colored patches and spots, edged with black; these are irregularly but gracefully disposed in bands, sloping down the sides, and running in lines along the head and neck. The under parts are white, spotted with black. The colors are exceedingly rich, and the whole effect indescribably beautiful. Of all the cat family, this is admitted to be the handsomest. Its activity and grace of movement are equal to the splendor of its skin. It lives in woods and thickets bordering upon streams or lakes, keeping itself concealed during the day, and sallying forth on its hunt by night. It climbs trees with agility, where it pursues its game, especially birds and monkeys, with great address. It is said to practice a trick on the latter animal which shows a good appreciation of monkey character. It will stretch itself out on the



THE OCELOT.

limb of a tree, as if dead. The monkeys cannot restrain their curiosity, and so approach to see what this means. When they come within reach, they are suddenly grasped by the teeth and claws of the wily deceiver. The ocelot also devours small quadrupeds, as well as eggs. If by chance it is discovered by man, it conceals itself by crouching upon the larger branches of the trees, or in the bottoms of decayed trunks. It runs like the fox and wild-cat when pursued by the hunters and their hounds, often seeking to baffle the chase by doubling and resorting to various artifices. In case of extremity it ascends a tree. It is savage and spiteful in its defense, and snarls and spits at a stranger when confined in a cage. If taken young, however, it may be rendered quite tame, so as to be left at liberty; thus domesticated, it manifests strong attachment for its master. Mr. Bennett states that a male specimen in the Tower Menagerie was perfectly good-tempered, exceedingly fond of play, and had much of the character and manners of the domestic cat. Its food consisted principally of rabbits and birds; the latter it plucked with great dexterity, and always commenced its meal with the head, of which it seemed particularly fond; but it did not eat with the ravenous avidity which characterizes nearly all the animals of this tribe.

The Mitis, or Chati, *Felis mitis*, the *Chibiguazu* of Azara, is a native of Mexico and the countries south to Paraguay. It is smaller than the ocelot, but it resembles that animal, and has been confounded with it. Its ground-color is pale yellow above, figured with irregular dark patches, disposed in longitudinal rows. The lower parts are white, also marked with spots arranged in rows. These animals inhabit the deep forests by day, but go forth at night, sometimes visiting the farm-yards and killing the poultry. They live in pairs, and feed on birds and small quadrupeds. Their eyes shine in the night. They have the habits of washing their faces with their paws, cleaning themselves, fuffing, sneezing, &c., like the domestic cats. One of these animals in the Paris Menagerie was very gentle, and manifested great delight at being caressed. If any one with whom it was familiar passed the cage without noticing it, it would utter a plaintive cry of discontent.

The Pampas Cat, or Jungle Cat, *Felis pajero*, is found in the country bordering the Rio de la Plata. It is twenty-six inches in length, and thirteen in height, and is distinguished by hair three to four inches in length. The color is yellowi·h gray, with numerous irregular brown and yellow stripes running obliquely from the back along the sides. It lives in the pampas or plains, and not in the woods, concealing itself amid the dense masses of thorny shrubs, and feeding chiefly on Guinea-pigs.

The Margay, *Felis tigrina*, is of the size of the domestic cat; the Painted Ocelot, *Leopardus pictus*, the Grey Ocelot, *Felis armillata*, the Variegated Leopard, *L. variegatus*, the False Margay, *L. tigrinoides*, are all small species found in tropical America; the Kuichua, *F. macroura*, is of Mexico

Of lynxes, there appear to be several American species. The Bay Lynx, *Felis rufa*, or *Felis montana*, is also called the American Wild-Cat. It is two and a half feet long, and usually weighs somewhat less than twenty pounds; the head is round, the body slender, legs long, soles of the feet naked, hind-feet partially webbed, ears large, nearly triangular, and tipped with coarse hairs, which are shed in summer. The throat is surrounded with a ruff of long hair. The tail is short, slender, and turned up at the end. The general color is of a yellowish brown or bay; there is a line of darker brown rising from the shoulders to the tail, and circular longitudinal stripes of a similar shade upon the back. The sides are spotted with dark brown.

This animal is very extensively distributed, being found in all the less settled portions of North America, from latitude sixty north to the tropics. In the warmer parts of the United States it is abundant, and in some places is even a nuisance, from its depredations upon the eggs and poultry of the plantations. It usually chooses the wooded steeps of hills, or thick, swampy forests for its haunts; it feeds on eggs, rabbits, rats, squirrels, partridges, fish, and indeed almost any small quadruped it can master, or any bird it can seize. The hens, ducks, geese, and turkeys of the farm-yards fall victims to its voracity. It will follow flocks of wild turkeys, and seeing in what direction they are going, will proceed by a short cut to the path they are likely to take, where it crouches down, and when one of them comes within its reach it bounds upon it and seizes it. It is a very shy animal, and when hunted displays great address in eluding both dogs and hunters. It is very timid, yet makes a stout defense when driven to extremity. It is a tolerable swimmer, and has not the general aversion of the cat family to the water. Its usual home is in the hole of a tree, or a space beneath a log. The female makes a bed of moss and leaves, where she produces from two to four young at a birth. All attempts to domesticate this species have proved fruitless. The flesh is said to be white like veal, and of good flavor.



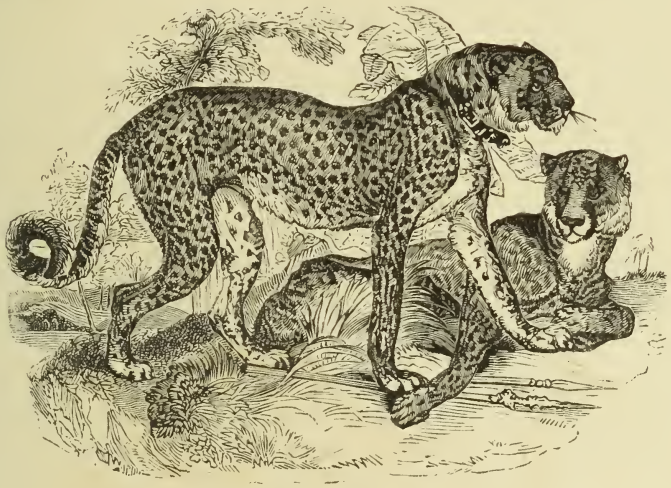
The Canada Lynx.

The Canada Lynx, *Felis Canadensis*, the *Loup Cervier* of the French, and *Peshoo* of the Indians, has a round, broad head, large eyes, strong teeth, ears acute and tipped with long hairs. The body is robust, the legs thick and clumsy, the toes strong and imbedded in fur. The fur has a woolly appearance, the under part being very close and soft. The general color of the back is gray, with a rufous tinge; the sides are gray, the under surface dull white. There are irregular spots of brown over nearly the whole form, these markings varying in different species. The length of the body is thirty-three to thirty-eight inches; the tail six inches.

The Canada lynx is a northern species, being found from latitude sixty-six degrees north to Pennsylvania. It is occasionally found in the unsettled parts of the northern United States, but

it is most common in Canada. It is of exceedingly retired habits, and feeds on grouse, hare, rabbits, squirrels, &c. It occasionally catches a wild goose, a marmot, a porcupine, and even a deer. The young fawns frequently become its victims. Like the rest of its kind, it breeds but once a year, and generally produces two at a birth. The skins are used for muffs and collars, and are much esteemed. Many hundreds of them are annually taken by the hunters and trappers. The Indians regard their flesh as good eating. When alarmed or pursued, it proceeds by leaps or bounds, and if hard pressed, takes to a tree. Its claws are of great strength, and it defends itself powerfully. It can leap from a great height without injury, and is likewise a good swimmer.

This animal so nearly resembles the common lynx of Europe that it has been regarded as of the same species. This opinion is now generally abandoned. It is believed, however, that the same species exists in the northern parts of Asia.



THE CHEETAH.

Genus GUEPARD, presents a single species, the CHEETAH, *Felis jubata*, called also the *Youze* and *Hunting-Leopard*, celebrated alike for its beauty and its interesting qualities. In its conformation and character this animal seems to combine something of the dog and cat, whence it is called *Cynailurus* by some naturalists. It has a circular pupil, and is chiefly diurnal in its habits. In size and shape it is between the leopard and the hound. The color is yellowish fawn above, and nearly pure white beneath. It is covered on the upper parts with numerous black spots, from half an inch to an inch in diameter. A slight mane runs along the neck. The hair generally has a crispness, distinguishing it from the softness of that of the cat's. The skins are an article of some importance in the trade of the western coast of Africa. The intelligence, tractability, and fidelity of the cheetah are such that it has been trained to the chase of the antelope in the East. Several of them are carried to the field in low cars whereon they are chained, each one being hooded. When the hunters come within view of a herd of antelopes, one leopard is unchained, his hood is removed, and the game is pointed out to him; for he is directed in the pursuit by his sight. Perceiving the object, he steals along cautiously and crouchingly, taking advantage of every means of masking his attack, till he has approached the herd unseen, within killing distance, when he suddenly launches himself upon his quarry with five or six vigorous and rapid bounds, strangles it instantaneously, and drinks its blood. The huntsman now approaches the leopard, caresses him, wins him from his prey by placing the blood which he collects in a wooden ladle under the nose of the animal, or by throwing to him pieces of meat; and while he is thus kept quiet, hoods him, leads him back to his car, and then chains him. If the leopard fails in his attack, he returns to his den with a mournful and dejected air.

Of the habits of the hunting-leopard in a state of nature we have but little knowledge. It is

found both in Asia and Africa; it is common in Persia, India, and Sumatra, and the country around the Cape of Good Hope. A pair of them were in the Zoological Gardens a few years since, and are described as having been exceedingly graceful and beautiful animals, purring when pleased, and mewing when discontented. They seemed to possess none of the sly and skulking habits of the cats; on the contrary, they were frank and confiding, and manifested great fondness for their keeper.

Fossil Felidæ.—Among the relics of extinct animals, those of the cats are numerous and diversified. In the second, or *miocene* period of the tertiary formations, are found the first traces of the larger fossil cats. Four species, some as large as the lion, are enumerated by Professor Kaup. In the third and fourth, or *pliocene* period, the bones of the herbivorous animals become more abundant, and as the destroyers were needed, according to the universal system of nature, to limit their increase, we find the bones of the carnivora to increase in proportion. Among them, the geologists specify numerous species of cats similar to the tigers, lions, leopards, and tiger-cats of our own time.

It is interesting to observe, that while most of the large species of that age have become extinct, the wild-cat, the progenitor of our domestic cat, which existed at that time, has survived. There are very few animals known to us that can boast a lineage so ancient as Puss. A curious instance of the strange operations of nature in these remote periods is mentioned by Dr. Lund in his Fossil Fauna of Brazil. In that country he discovered the bones of a species of hunting-leopard—an animal now only known in Asia and Africa—of the size of the domestic cat! To this he gave the name of *Cynailurus minutus*. He also discovered the fossil remains of an animal similar to the jaguar, but of the size of the tiger, or even the lion, of the Old World. What curious glimpses these revelations afford of those dim ages of the earth, lost to man, and unwritten and unrecorded save by the Creator alone! And other facts unfold still more startling wonders to the view. As we have before stated, the bones of many animals belonging to orders which are at the present time strictly tropical, have been found in abundance in different parts of Northern Europe. Among the Brazil fossil cats, Professor Owen enumerates four species, one of them, the Great Cave-Tiger, *Felis spelæa*, being of the size of the jaguar. In connection with these facts, the same author presents the following interesting observations:

"It is too commonly supposed that the lion, the tiger, and the jaguar are animals peculiarly adapted to a tropical climate. The genus *Felis* is, however, represented by species in high northern latitudes, and in all the intermediate countries to the equator; and there is no genus of Mammalia in which the unity of organization is more closely maintained, and in which, therefore, we find so little ground in the structure of a species, though it may most abound at the present day in the tropics, for inferring its special adaptation to a warmer climate. A more influential, and indeed the chief cause or condition of the prevalence of the larger feline animals in any given locality, is the abundance of the vegetable-feeding animals in a state of nature, with the accompanying thickets or deserts unfrequented by man. The Indian tiger follows the herds of antelope and deer in the lofty Himalayan chain to the verge of perpetual snow. The same species also passes that great mountain barrier, and extends its ravages, with the leopard, the panther, and the cheetah, into Bocharia, to the Altaian chain, and into Siberia as far as the fiftieth degree of latitude, preying principally on the wild horses and asses. It need not, therefore, excite surprise that indications should have been discovered in the fossil relics of the ancient Mammalian population of Europe, of a large feline animal, the contemporary of the mammoth, of the tichorine rhinoceros, and of the gigantic cave-bear and cave-hyena, and the slayer of the oxen, deer, and equine quadrupeds that so abounded during the same epoch."



THE STRIPED HYENA.

THE HYENIDÆ, OR HYENINÆ.

As several distinguished authors of the present age have undertaken to reconcile the world to the Great Man-Killer of Modern times; as Aaron Burr has found an apologist, and almost an eulogist; as Eugene Aram has been commended to our sympathy, and Jonathan Wild apotheosized in romance; and as learned commentators have recently discovered that even *Judas Iscariot* was a true disciple, we are rather surprised to find that some one has not undertaken to render the family of Hyenas popular and amiable in the eyes of mankind. Certain it is, that few marked characters in history have suffered more from the malign inventions of prejudice. The ancients

charged the hyena with magical powers, and the terrible attribute of bisexuality, and the moderns have heaped upon him the disreputable accusation of untamability. The striped hyena is said, even in grave-yards, and when it is about to make its abominable feasts, to utter a fearful howl, which is compared to a mocking laugh, whence he is called the "Laughing Hyena." This has operated on the lively imaginations of the Orientals—where this creature is common—in such a manner, that they believe the grave-yards peopled with disgusting demons, whom they called Ghouls, and so this animal is charged with having evoked the demonology of the Arabians and other Eastern nations from the ghastly precincts of the tomb. Such injustice might be made to excite sympathy, and the ardent defenders could easily, as in the cases of the human hyenas above alluded to, slide into gentle and generous apologists. It is true, the disagreeable reputation of violating the sanctuaries of the dead, and of occasionally feeding on some innocent little Red Riding-Hoods, together with wholesale thieveries and robberies, practiced from time immemorial, might seem rather hard features to be blended into an agreeable portrait, but who can tell what the seductive colors of Bulwer, Ainsworth, and the "Berkley Men" might do? Napoleon killed a million of living men, and we may well doubt if all the hyenas in the world have devoured as many dead ones from the beginning of time. The same pen that could make the first a sublime object of hero-worship, might at least offer a handsome apology for the last. Aaron Burr was the moral and political hyena of his day; so at least cotemporary society adjudged him. What infinite skill, what admirable talent, is that which could shroud the memory and the grave of such a man in the dainty sackcloth of the proverb, "*Of the dead, only good!*" And if German erudition, seconded by the author of the "English Opium-Eater," can lift from the name of Judas the curse of eighteen centuries, what might not be achieved in behalf of the hyena, if any one could be found to set about it? As for ourselves, not permitted to indulge in the agreeable relaxation of inditing romance, we must proceed in our stern task of telling the truth, the whole truth, and nothing but the truth.

The *Hyenas*, or *Hyænas*, then, are a family of digitigrade carnivorous mammalia, distinguished by having their fore-legs longer than their hind-legs, by their rough tongue, great and conical molar, or rather cutting and crushing teeth, coarse, rough hair, projecting eyes, large ears, and a glandular pouch beneath the anus. The incisors are six above and six below; the canines, one above and one below; the molars, five above and four below; the whole number of teeth, thirty-four. The false molars, three above and four below, are conical, blunt, and very large. The upper flesh-tooth has a small tubercle within and in front, but the lower one has none, and presents only two trenchant points. The whole of the dental and molar organization, and indeed the whole cranial structure, appears to have been formed with a view to the bringing into the most available action, the formidable natural instruments which enable the hyenas to break the hardest bones. In illustration of this, Dr. Buckland gives the following account of the feats of a Cape hyena which he saw at Oxford in the traveling collection of Mr. Wombwell: "I was enabled to observe the animal's mode of proceeding in the destruction of bones. The shin-bone of an ox being presented to this hyena, he began to bite off with his molar teeth large fragments from its upper extremity, and swallowed them whole as fast as they were broken off. On his reaching the medullary cavity, the bone split into angular fragments, many of which he caught up greedily and swallowed entire. He went on cracking it till he had extracted all the marrow, licking out the lowest portion of it with his tongue; this done, he left untouched the lower condyle, which contains no marrow, and is very hard. * * * * I gave the animal successively three shin-bones of a sheep; he snapped them asunder in a moment, dividing each in two parts only, which he swallowed entire, without the smallest mastication. On the keeper putting a spar of wood two inches in diameter into his den, he cracked it in pieces as if it had been touchwood, and in a minute the whole was reduced to a mass of splinters. The power of his jaws far exceeded any animal force of the kind I ever saw exerted, and reminded me of nothing so much as a miner's crushing-mill, or the scissors with which they cut off bars of iron and copper in the metal founderies."

The power displayed by the jaws of the heyna would indeed almost surpass belief, if an examination of the structure of the animal did not explain the phenomenon. The muscles of the jaws, aided by the muscles of the neck, are so strong that it is almost impossible to drag from its vice-

like gripe that which the animal has once seized upon. Cuvier remarks that its efforts in this way sometimes produce anchylosis of the cervical vertebræ, and that this has given rise to the assertion that hyenas have but a single bone in the neck. He also states that their name among the Arabs is the symbol of stubbornness. The feet have four toes each, like those of the suricates. The same author sums up their character by saying that they are voracious nocturnal animals, inhabiting caverns, living for the most part on carcasses, for which they ransack the tombs, and that they are the subjects of an infinity of superstitious traditions.

Under the term *Hyeninæ* we include two genera, the *Hyenas* proper and the *Proteles*.

Genus HYENA: *Hyæna*.—Of this there are two species, though some authors regard one only as a variety; the Striped Hyena and the Spotted Hyena. The former, the *Hyæna striata*, is the Ὕαινα, the hyena of the ancients; the *Canis hyæna* of Linnæus; *H. striata* of Zimmerman; *H. vulgaris* of Desmarest; and *H. antiquorum* of Temminck; *H. orientalis* of Tiedemann; the *Hooandor* of Buffon, Bennett, and other writers. When full grown, it is about the size of a large dog or wolf, but shaggy and ragged in its appearance. The hair is of a rough, wiry texture; and along the dorsal line, from the head to the insertion of the tail, there runs a coarse, bristly mane, which gives a peculiar character to the back of the animal, to which there is scarcely any thing corresponding among other beasts of prey. The tail is short and bushy, sometimes plain, and sometimes fringed with black. Under the tail there is an orifice, which communicates with a sort of sack or pouch, containing a substance resembling civet, but much more offensive to the smell. The head is broad and flat; the eyes are large, and exhibit a peculiar expression of wildness and sullen ferocity. The ground-color of the body is generally of a clear fawn, but there are many varieties of shade in the species. Some are of a deep brown tint, and others brownish gray; and they are invariably brindled or striped with darker shades. The snout is black and remarkably full; the legs are very strong, and altogether the animal is very formidable in proportion to its size. In the carriage of its head it resembles a dog on the scent; and when dislodged from cover, and obliged to retreat, it limps off at first, seemingly hunch-backed and lame; but when it has measured a short distance, these apparent impediments wear off, and it steps out at a rapid rate.

The striped hyena is a wild and solitary animal, and chooses for its habitation the most hidden dens and caverns of the earth; and, when nature fails to provide it with a dwelling-place in its favorite locality, it sets to work and excavates a hole in the cleft of a rock, or some other mountainous recess, for its own accommodation. The cry it utters is very peculiar. It commences with a low moaning sound, not unlike that of a human being under the influence of pain, and gradually rises into the most loud and violent bellowing. It generally conceals itself during the day-time, and comes forth in the night in quest of its prey. In their roaming for this end, hyenas are peculiarly assiduous and daring, and do not turn aside from obstacles that would be accounted insurmountable by much larger animals. When put to it, they will not shrink from an encounter with the panther, or even the lion himself, and they frequently attack and vanquish the ounce and other animals much larger than themselves. In their nocturnal prowlings, when excited by hunger, they do not hesitate to visit the habitations of man, and the inclosures round these do not always prove a sufficient protection from their savage attacks on such domestic animals as they mark out for their victims. Nor does the sight of man, or the report of fire-arms, always scare them from their prey. The most revolting of all the characteristics in the economy of the hyena, is its sacrilegious violations of the repositories of the dead; and what is scarcely less so, is its blood-thirsty propensity of following armies, and of feasting on the remains of those who may be slain in battle. Though, generally speaking, unsocial animals, hyenas have been known to unite in considerable numbers on occasions, such as the watching and dogging of the movements of contending armies, attacking flocks and herds, or when the live-stock of the village is marked out for plunder. This species seems to be common in most parts of Africa, and especially in the northern and central portions. It often prowls about the towns and villages, and Niebuhr tells us that in the Gaboon country, in the summer, when the inhabitants sleep in the open air, it will sometimes snatch away children from the sides of their parents. Travelers in Africa constantly speak of the hyenas that throng about their camps at night, and sometimes destroy their asses, and even horses. It has

been the custom, among other fabulous assertions, to state that the hyena is not to be tamed, but Mr. Bennett, who had an opportunity of observing them in the Tower Menagerie, says there is scarcely any animal that submits with greater facility to the control of man. He speaks of the docility and attachment to his keepers manifested by the striped hyena, especially when allowed a certain degree of liberty, which the animal shows no disposition to abuse, though those which are carried about from fair to fair in close caravans are surly and dangerous from irritation and ill-treatment. The individual which Mr. Bennett describes was remarkably tame, and confined in the same den with one of the American bears. Colonel Sykes remarks, that this species, the *Turrus* of the Mahrattas, is numerous in the Deccan, and susceptible of the same domestication as a dog. Other travelers speak of the hyena as capable of being tamed, and performing the duty of watch-dogs.

The striped hyena is found in Asia, the mountains of Caucasus, and the Altaian chain, Asiatic Turkey, Syria, Persia, Barbary, and Senegal, and even as low as the Cape. There are specimens in the Gardens of the Zoological Society of London, the Garden of Plants, Paris, and are common in the other menageries of Europe and those of this country.

It seems uncertain whether this is the animal alluded to in the Bible. Some translate the words rendered in our copies of the Holy Scriptures "the valley of Zeboim"—1 Sam. xiii. 18; Nehem. xi. 34—as "the valley of hyenas;" and the "Seventy" render the words given by the English translators as "a speckled bird," and "a bird of divers colors"—Jer. xii. 9—as "the cave of the hyena," Ξπηλαιον Ὑαίνης, while others would substitute one of the Hebrew letters composing the word in Samuel for another, and make the reading "vipers," as if certain streaked serpents were meant. Bochart shows that by the Tsabhua, or Tseboa, the word occurring in the ninth verse of the twelfth chapter of Jeremiah, the hyena was intended, and if this opinion be correct, there can be little doubt that "the valley of Zeboim" means "the valley of hyenas." Dzuba and Dubba are, it appears, Arabic names for this species.

Whatever may be the opinions as to the striped hyena being alluded to in those passages of Scripture which we have quoted, there can be no doubt that it is the Ὑαινα of Aristotle and the Greeks. The most monstrous fables, as we have already intimated, were rife respecting this animal, and the extent to which they had reached may be supposed, when we find Aristotle taking pains to demonstrate the absurdity of the assertion that the animal was bisexual, or a true hermaphrodite. It would be a waste of time and space to enumerate all the wonderful powers that were attributed to it; but among other accomplishments, in addition to those already alluded to, it was said to imitate the language of men, in order to draw to it shepherds, whom it devoured at leisure, and to have the power of charming dogs so that they became dumb!

The Spotted Hyena, *H. maculata*, is the *Tiger-Wolf* of the colonists at the Cape; *Canis crocuta* of Erxleben and Gmelin; *Hyæna crocuta* of Zimmerman; *Hyæna Capensis* of Desmarest; *Crocuta maculata* of Gray. It inhabits Southern Africa, and is to be met with in large numbers in the vicinity of the Cape of Good Hope. It is smaller than the striped species, and the bristly mane does not extend beyond the loins, betwixt which and the tail a few scattered, produced hairs only are observable. Its general tint, on the upper part of the body, is dull yellow, and the belly and limbs are blackish brown. A deeper tinge of this last spots almost every part of the body. The character and habits of this species, in point of ferocity, do not differ materially from the striped hyena, except, perhaps, that they are even more daring when pressed by hunger, and more easily reduced to a state of domestication. Their feelings, both of hatred and affection, seem to be equally strong. Instances are recorded of individuals manifesting the liveliest affection and regard for their keepers; while, on the other hand, they would exhibit the most violent rage against persons who had given them no cause of offense. Barrow relates that the spotted hyena is met with in a domesticated state in the district of Schneuberg, where it is found equal in point of intelligence and fidelity to the dog, and even more serviceable in the chase than that animal. In the wild state they have been known to enter the huts of Hottentots and carry off children, when they were left unprotected; and Thunberg tells us, that such is their audacity, that they will eat the shoes from off the feet, and the saddle from under the head of the traveler, who happens to make his couch in the open air.

Numerous writers have treated of the habits of this destructive animal. From them it appears that it is more numerous and more widely diffused than the other kind common in that quarter, which has the name of the *Strand* or *Coast Wolf*—the *H. villosa*, hereafter to be described: it is also more voracious and destructive, not only devouring such animals as it chances to find dead, but also carrying off the smaller ones from the pens of the farmers during the night, and often succeeding in killing and mutilating such of the larger kinds as have not been secured before dusk. Sickly animals, it appears, are less liable to suffer from the voracity of this creature than those that are in full health,—the latter, by their rapid flight, inspiring their enemy with a courage of which by nature he is destitute; whereas, the sickly face him, and thus intimidate him from attacks which might be successful if made. So anxious is he for the flight of the animals as a preliminary to his attack, that he uses all the grimace and threatening he can command to induce them to run, and never dares to attack them unless they do so.

"The character of this hyena," says an eminent author, "makes his destruction an object of no small importance to the farmers, whose ingenious snares for him call forth amazing cunning and dexterity on the part of the animal to render them of no avail. The more common methods employed against beasts of prey, such as spring-guns, traps, &c., do not succeed in his case. During his nocturnal wanderings, he minutely examines every object that presents itself to his notice with which he is not perfectly familiar; and if he see reason to suspect that it can injure him, he will turn back and make his way in an opposite direction. Thus cords or leather thongs, which are often laid across the footpaths the hyena is accustomed to travel upon, and which are attached to the triggers of loaded guns, with the design that his contact with the thong may cause the discharge of the gun in his direction, are very carefully examined by him, and the usual result of his examination is his deciding against trusting himself in contact with them. The farmers have so often observed this result, that they now very rarely attempt his destruction by this means, but occasionally succeed by substituting for cords the delicate stems of creeping plants, which are regarded by him without suspicion until he has actually suffered through them. Many other ingenious methods, suggested by the necessity of the case, have been adopted by the farmers for the destruction of hyenas; but a description of them, though elsewhere desirable, would here be out of place.

"This species seldom, if ever, moves abroad during the day, but passes that period in a state of repose, either in holes in the ground, or in retired situations densely covered with bush. Night is his favorite season for seeking his food; and toward nightfall his howlings are regularly heard, announcing to the various animals the approach of their voracious enemy, and thus enabling many of them to escape his wiles. The propensity this beast has for howling seems, therefore, to be disadvantageous to him; and if his almost continuous noise be not intended to put the animals upon which he preys upon their guard, its actual purpose is scarcely conceivable. Some have surmised it to be his call to creatures of his own species; but that this is not the case, is certain from the fact that hyenas are heard to utter their supposed call even while separating from each other further and further as each cry is uttered; in addition to which it may be remarked that it is contrary to the habit of this animal to hunt in company, or even to congregate in large numbers, save when assembled by the temptation of an abundance of carrion. A still further proof that the hyena's cry is not a friendly call to his own species, may be found in the fact, that when individual hyenas have found a dead animal they cease to utter their melancholy howl, as if in fear of calling participators of their feast."

It appears from the above interesting account, that the spotted hyena puts in practice "all the grimace and threatening he can command" to induce the objects of his attack to run; in other words, his plan of attack is founded upon intimidation. May not his howls be intended to inspire terror and shake the nerves of the animals within hearing of the doleful nocturnal sounds?

"Till lately," adds the author just quoted, "hyenas were in the habit of paying nightly visits to the streets of Cape Town, and were regarded as very useful in carrying away the animal refuse, which might otherwise have been disagreeable. This however no longer occurs, partly perhaps from better regulations now existing in the town, and partly from the number of these animals having very greatly decreased. Even now, however, individual hyenas occasionally approach the

town, and their howlings are sometimes heard under Table Mountain, and in other directions, during the nights. In the countries inhabited by the Kaffirs they are very numerous and daring, generally approaching the villages during the night, and attempting, either by strength or stratagem, to pass the wattles by which the houses are defended. If they be thus far successful, they next endeavor to enter the houses, which they sometimes accomplish, in which case they not unfrequently carry off some young child of the family. Scars and marks on various parts of the body often testify to the traveler how dangerous a foe the natives have in this animal."

Mr. Steedman, in his "Wanderings and Adventures in the Interior of Southern Africa," gives most appalling accounts of the rapacity of the spotted hyena. He states that Mr. Shepstone, in a letter from Mamboland, relates that the nightly attacks of wolves, as the hyenas are generally called, have been very destructive among the children and youth; for within a few months not fewer than forty instances came to his knowledge wherein that beast had made a most dreadful havoc. "To show clearly," says that gentleman, "the preference of the spotted hyena for human flesh, it will be necessary to notice that when the Mambookies build their houses, which are in form like bee-hives, and tolerably large, often eighteen or twenty feet in diameter, the floor is raised at the higher or back part of the house, until within three or four feet of the front, where it suddenly terminates, leaving an area from thence to the wall, in which every night the calves are tied to protect them from the storms or from wild beasts. Now it would be natural to suppose, that should the wolf enter, he would seize the first object for his prey, especially as the natives always lie with the fire at their feet; but notwithstanding this, the constant practice of this animal has been in every instance to pass by the calves in the area, and even by the fire, and to take the children from under the mother's kaross, and this in such a gentle and cautious manner, that the poor parent has been unconscious of her loss until the cries of her little innocent have reached her from without, when a close prisoner in the jaws of the monster." Mr. Shepstone then particularizes two instances within his own knowledge, one of a boy about ten years of age, and the other of a little girl about eight, who had been carried off by this species, and wretchedly mangled, but recovered by the attention of Mr. Shepstone and his friends. Notwithstanding this ferocity, the spotted hyena has, it is stated, been occasionally domiciliated in the houses of the peasantry, "among whom," says Mr. Bennett, "he is preferred to the dog himself for attachment to his master, for general sagacity, and even, it is said, for his qualifications for the chase."

The strength of these animals, and their power of dragging away large bodies, is strikingly exemplified in Colonel Denham's narrative. At Kouka he relates that the hyenas, which were everywhere in legions, grew so extremely ravenous, that a good large village, where he sometimes procured a draught of sour milk on his duck-shooting excursions, had been attacked the night before his last visit, the town absolutely carried by storm, notwithstanding defenses nearly six feet high of branches of the prickly tulloh, and two donkeys, whose flesh these animals are, according to our author, particularly fond of, carried off, in spite of the efforts of the people. "We constantly," continues Colonel Denham, "heard them close to the walls of our own town at night, and on a gate being left partly open, they would enter and carry off any unfortunate animal that they could find in the streets." From the same narrative it appears that it was necessary to protect the graves from the attacks of these rapacious brutes. Mr. Toole's grave had a pile of thorns and branches of the prickly tulloh, several feet high, raised over it as a protection against the flocks of hyenas which nightly infested the burying-places in that country.

The Strand Wolf, *H. villosa*, has been already alluded to, and is held by some naturalists to be a variety of the striped hyena. It is about four feet four inches long, the hair coarse and shaggy on the body, and short and crisp over the head, ears, and extremity. The general color is a grizzled brown. It inhabits the sea-coast throughout the whole extent of Southern Africa, but is by no means so common as the spotted hyena. It lives chiefly on carrion and such dead animal substances, whales for instance, as the sea casts up; but when pressed by hunger, its habits seem to resemble those of the other species, for it then commits serious depredations on the flocks and herds of the colonists, who hold its incursions in great dread. Mr. Steedman, who makes this statement, says he saw a very fine specimen, which had been shot by a farmer residing in the vicinity of Blauwberg, and was informed that it had destroyed three large calves belonging

to the farmer. He adds, that it is said to be a remarkably cunning animal, retiring to a considerable distance from the scene of its depredations to elude pursuit, and concealing itself during the day-time in the mountains, or in the thick bush, which extends in large patches throughout the sandy district in which it is usually found.

The Brown Hyena, *H. rufa* of Cuvier, *H. fusca* of Geoffroy, and *Crocuta brunnea* of Gray, found in Southern Africa, is probably a variety of the *H. villosa*.

Fossil Hyenas.—The hyenas of the present day are wholly confined to warm climates, and the continents of Asia and Africa—but it appears that in the third period of the tertiary deposits, the pliocene period of Lyell, their bones are found in various localities,—in Germany, Italy, France, and England, and in South America. Four species are identified, but none of the present races. It would appear that these animals were once abundant in these northern climates, as Dr. Buckland calculates that the bones of four hundred hyenas were found, in a broken and fragmental state, in the single cavern of Kirksdale, in England. In other caves, vast numbers of the remains of hyenas have been discovered—among them, those of the Great Cave-Hyena, *H. spelæa*—mingled with the bones of other animals, from which it has been concluded that these places were, for many ages, the abodes of these greedy brutes, and that here they devoured their prey.

Genus PROTELES: *Proteles*.—Of this there is a single species—the Aard-Wolf or Earth-Wolf, the *Proteles Lalandii* of Is. Geoffroy, and *Viverra cristata* of Sparrman; *Proteles hyænoïdes* of Gervais. It is found in Southern Africa, and along the eastern portions as far north as Nubia and Abyssinia: it derives its name—given by the European colonists—from its habit of burrowing in the earth. It is alike curious to the common and to the scientific observer. To the external appearance and osteological structure of a hyena, this truly singular animal unites the head and feet of a fox, and the intestines of a civet. Its teeth are remarkable: the permanent canines are tolerably large, but the molars are small, and separated by intervals. It has five toes on the fore-feet, and four only on the hind; the innermost toe of the fore-foot is placed, as in the dogs, at some distance above the others, and therefore never touches the ground when the animal stands or walks. The legs also are completely digitigrade; that is to say, the heel is elevated, and does not come into contact with the surface, as in man and other similarly formed animals, which walk upon the whole sole of the foot, and are thence said to be plantigrade. It is of great importance to remark the difference between these two modifications of the locomotive organs, because they have a very decided and extraordinary influence upon the habits and economy of animal life. Digitigrade animals, which tread only upon the toes, and carry the heel considerably elevated above the ground, have much longer legs than plantigrade animals, and are, therefore, especially fitted for leaping and running with great ease and rapidity. Accordingly, it will be observed that the horse, the stag, the antelope, the dog, and other animals remarkable for rapidity of course, partake strongly of this formation; and even their degree of swiftness is accurately measured by the comparative elevation of the heel. Inattentive observers sometimes misapprehend the nature of this peculiar conformation of the extremities of digitigrade animals, and are apt to confound the hough with the ankle, and to mistake for the knee what is really the heel of the animal. Thus we have heard it said that, in the hind-legs of the horse, the knee was bent in a contrary direction to that of man. This is by no means true: a little attention to the succession of the different joints and articulations, will show that what is called the cannon-bone in the horse, and other digitigrade animals, in reality corresponds to the instep in man; and that what is generally mistaken for the knee really represents the heel.

In the particular case of the Proteles, the natural effect of the digitigrade formation is, in some degree, lessened by the peculiar structure of the fore-legs, which, contrary to the general rule observable in most other animals, are considerably longer than the hind. In this respect, also, the Proteles resembles the hyenas; and in both genera this singular disproportion between the anterior and posterior extremities abridges the velocity properly due to their digitigrade conformation.

The size of this curious animal is about that of a full-grown fox, which it further resembles in its pointed muzzle; but it stands higher upon its legs, its ears are considerably larger and more naked, and its tail shorter and not so bushy. At first sight it might be easily mistaken for a

young striped hyena, so closely does it resemble that animal in the colors and peculiar markings of its fur, and in the mane of long stiff hair which runs along the neck and back; indeed, it is only to be distinguished by its more pointed head, and by the additional fifth toe of the fore-feet. The fur is of a woolly texture on the sides and belly, but a mane of coarse stiff hair, six or seven inches in length, passes along the nape of the neck and back, from the occiput to the origin of the tail, and is capable of being erected or bristled up, like that of the hyena, when the animal is irritated or provoked. The general hue of the fur is pale ash-color, with a slight shade of yellowish brown; the muzzle is black and almost naked, or covered only with a few long stiff mustaches. Around the eyes, and on each side of the neck, are dark brown marks; eight or ten bands of the same color pass over the body in a transverse direction, exactly as in the common striped hyena; and the arms and thighs are likewise marked with similar transverse stripes. The legs and feet are of a uniform dark brown in front, and gray behind. The long hairs of the mane are gray, with two broad rings of black, the second of which occupies the point; those of the tail are similarly marked, and equally long and stiff; whence it appears as if the mane and tail were clouded with an alternate mixture of black and gray. The ears are gray on the interior surface, and dark brown on the outer.

In its habits and manners the aard-wolf resembles the fox: like that animal, it is nocturnal, and constructs a subterraneous burrow, at the bottom of which it lies concealed during the daytime, and only ventures abroad on the approach of night, to search for food, and satisfy the other calls of nature. It is fond of the society of its own species, and many individuals have been found residing together in the same burrow. As they are of a timid and wary character, they have generally three or four different entrances to their holes; so that, if attacked on one side, they may secure a retreat in an opposite direction. Notwithstanding the disproportionate length of their fore-legs, they are said to run very fast; and so strong is their propensity to burrow, that one of M. Delalande's specimens, perceiving itself about to be run down and captured, immediately ceased its flight, and began to scratch up the ground, as if with the intention of making a new earth. It generally lives on decayed flesh, but also devours ants. It is said to prefer the flesh of lambs, and M. Geoffroy suggests that it has also a fondness for the fat of the tails of the big-tailed sheep, common in Southern Africa. The habits of the animal, in respect to its food, are, however, little known.

THE MUSTELIDES.

The Mustelides, a term from *Mustela*, a weasel, embraces three tribes or divisions: the *Melidæ*, of which the badger is the type; the *Mustelins*, of which the weasel is the representative; and the *Loutrins*, of which the otter is the type. Among them there is great diversity of size, habits, color, and endowments; but they agree, generally, in being carnivorous or omnivorous—in having a long, thin, pliable body and short legs, qualifying them to pursue their prey in small openings and narrow passages, and in possessing fine furs. Some of them produce the most valuable furs of commerce. Several of the species are endowed with the power of diffusing a strong odor from a pouch beneath the anus.

THE MELIDÆ.

The animals of this tribe are all plantigrade, or nearly so, and for the most part omnivorous.

Genus BADGER: *Meles.*—Of this, according to the best authors, there are four species: the Common Badger of Europe, *M. vulgaris*; the American Badger, *M. Labradorica;* the Indian Badger, *M. collaris;* and the Anakuma Badger, *M. Anakuma*, of Japan. Some naturalists, however, regard them as constituting each a distinct genus.

The *European Badger*, which has some resemblance in form to the bear, like that animal is omnivorous, feeding on flesh or vegetables, according as opportunity may offer. Its dental system is indeed better adapted to the chewing and masticating vegetable substances than for tearing and cutting raw flesh. The principal character of the feet consists in its having five toes both before and behind, short, strong, deeply buried in the flesh, and furnished with powerful compressed claws, admirably calculated for burrowing or turning up the earth in search of roots. The



THE EUROPEAN BADGER.

legs are short and muscular; the body broad, flat, and compact, and about two feet four inches long; the head is more or less prolonged; the snout pointed; the ears small, and the tail short. Beneath the anus there is an aperture of considerable size which opens transversely, and exudes from its inner surface a greasy or oleaginous matter of very offensive odor. The same formation is observed in many other genera of carnivorous mammals, though the qualities of the substance secreted differ according to the species. In the civets and genets, for instance, its smell is so pleasing as to entitle it to the rank of perfume; while in the *Moufettes*, on the contrary, its odor is so extremely fetid as to have acquired for them, above all other animals, the generic name of *Mephites*, translated by the strong English term of *Stinkards*. In America we call them *Skunks*, a term which everybody's experience has defined without the aid of a dictionary.

The hide of the badger is amazingly thick and tough; the hair uniformly long and coarse over the whole body, and trailing along the ground on each side as the animal walks. The badger and its congeners offer a strange intermixture of colors, which is seen in no other mammal, except those of the genera *Gulo* and *Mephitis*, which approximate so nearly to it in many other respects: in general, the darker shades are found to predominate upon the back and upper parts of the body, and the lighter below; but in the animals above mentioned this general rule is reversed, and it is the light shades which occupy the back and shoulders, while the dark ones are spread over the breast and abdomen. The head of the badger, for instance, is white, except the region beneath the chin, which is black, and two bands of the same color, which rise on each side a little behind the corners of the mouth, and after passing backward and enveloping the eye and ear, terminate at the junction of the head and neck. The hairs of the upper part of the body, considered separately, are of three different colors—yellowish white at the bottom, black in the middle, and ashy gray at the point; the last color alone, however, appears externally, and gives the uniform sandy-gray shade which covers all the upper parts of the body: the tail is furnished with long coarse hair of the same color and quality, and the throat, breast, belly, and limbs are covered with shorter hair, of a uniform deep black.

Though the badger is found throughout all the northern parts of Europe and Asia, it is rather a scarce animal everywhere. Its food is chiefly roots, fruits, insects, and frogs, but it likewise destroys the eggs and young of partridges and other birds which build on the ground, and attacks the nests of the wild bees, which it robs with impunity, as the length of its hair and the thickness of its hide render it insensible to the sting of the bee. It lives in deep burrows, which it excavates, reposing in them during the day, and going forth at evening in search of its food. It chooses the most solitary woods for its residence, is quiet and inoffensive in its manners, but when attacked defends itself with a courage and resolution which few dogs of double its own size and weight can overcome. It bites angrily, and holds on with great tenacity, which it is enabled to do the more easily from the peculiar construction of the articulation or hinge that connects its under jaw with the skull, and which consists of a transverse condyle completely locked into a bony cavity of the cranium.

In England and Scotland this animal is rare, but the cruel sport of baiting the badger is still practiced. The poor brute is placed inside a kennel or cask, and dogs set at it, who are not unfrequently worsted by the badger, as its bite is terrific, and its skin so tough and loose, and the hair so thick, that the bites of the dog do not take full effect. The pleasure of this "sport," as in many other diversions of the sporting world, appears to consist in trying whether the dogs or the badger will be most mangled in a given time. The irritating the badger so as to make him more furious, has given rise to a word in all the dictionaries—that of *badgering*.

The badger is not mentioned by Aristotle in his Natural History, and possibly it may not be found in Greece, as the ancient language of that country has not even a name for it, and as it is less common in the southern than in the northern parts of Europe. Pliny, however, notices it under the name of *Melis*, and various other Roman authors have spoken of it. More recent writers call it *Taxus*, a name perhaps derived, like other Roman names of northern animals, from the German language, in which the badger is called *Zachs* or *Dachs;* in Dutch, *Das*.

The female brings forth her young in the early part of spring, to the number of three, four, or five; she continues to suckle them carefully for the first five or six weeks, and afterward accustoms them gradually to shift for themselves. When taken young they are easily tamed, and become as familiar and playful as puppies; they soon learn to distinguish their master, and show their attachment by following or fawning upon those who feed them; the old, however, are always indocile, and continue solitary and distrustful under the most gentle treatment.

The badger is hunted in some parts of Europe during the bright moonlight nights, when he goes abroad in search of food. The hide, when properly dressed, makes the best pistol furniture; the hair is valuable for making brushes to soften the shades in painting; and the hind-quarters, when salted and smoked, are said to make excellent hams. Bell informs us that he saw dozens of badgers at a time hanging in the meat-markets of Pekin: there seems, indeed, no reason why it should be inferior to the flesh of the bear, which is universally esteemed by all who have tasted it.

The *American Badger* measures about two feet and a half from the muzzle to the root of the tail, which is five inches more. Its snout is less attenuated than that of the European species, though its head is equally long; its ears are short and round, the claws of its fore-feet much longer in proportion than those of the common species, its tail comparatively shorter, its fur of a quality altogether different, its colors also very different, and its appetites more decidedly carnivorous; the head and extremities alone are covered with short coarse hair; all the other parts of the body are furnished with remarkably soft, fine, silky fur, upward of four inches in length, and differing only in being rather more sparingly supplied on the under than on the upper parts.

This animal, the *Carcajou* of Buffon, the *Taxus Labradoricus* of Long's Expedition, the *Taxidea Carcajou* of Gervais, is called *Brairo* and *Siffleur* by the Canadians, *Mistonusk* and *Awawteekœoo*, or the *Digging Animal*, by the Crees, and *Chocartoosh* by the Pawnee Indians. Its form and habits have been described by Sir John Richardson as follows:

"The *Meles Labradorica* frequents the sandy plains or prairies which skirt the Rocky Mountains as far north as the banks of the Peace River, and sources of the River of the Mountains, in latitude 58°. It abounds on the plains watered by the Missouri, but its exact southern range has

not, as far as I know, been defined by any traveler. The sandy prairies in the neighborhood of Carlton House, on the banks of the Saskatchewan, and also on the Red River that flows into Lake Winnipeg, are perforated by innumerable badger-holes, which are a great annoyance to horsemen, particularly when the ground is covered with snow. These holes are partly dug by the badgers for habitations, but the greater number of them are merely enlargements of the burrows of the *Acetomys Hoodii* and *Richardsonii*, which the badgers dig up and prey upon. While the ground is covered with snow, the badger rarely or never comes from its hole; and I suppose that in that climate it passes the winter, from the beginning of November till April, in a torpid state. Indeed, as it obtains the small animals upon which it feeds by surprising them in their burrows, it has little chance of digging them out at a time when the ground is frozen into a solid rock. Like the bears, the badgers do not lose much flesh during their long hibernation, for on coming abroad in the spring they are observed to be very fat. As they pair, however, at that season, they soon become lean. The badger is a slow and timid animal, taking to the first earth it meets with when pursued; and as it makes its way through the sandy soil with the rapidity of a mole, it soon places itself out of the reach of danger. The strength of its fore-feet and claws is so great, that one which had insinuated only its head and shoulders into a hole, resisted the utmost efforts of two stout young men, who endeavored to draw it out by the hind-legs and tail, until one of them fired the contents of his fowling-piece into its body. Early in the spring, however, when they first begin to stir abroad, they may be easily caught by pouring water into their holes; for the ground being frozen at that period, the water does not escape through the sand, but soon fills the hole, and its tenant is obliged to come out.

"The American badger appears to be a more carnivorous animal than the European one. A female which I killed had a small marmot, nearly entire, together with some field-mice, in its stomach. It had also been eating some vegetable matters."

As to the southern limit of the geographical range of the species, at least in one direction, it is known to inhabit Mexico, as appears from the detailed and correct descriptions of Fernandez, who calls it by the native name of *Ilacoyotl* or *Coyotlhumuli;* and a very fine skin was some time ago sent from California to the Zoological Society of London.



THE INDIAN BADGER.

The Indian Badger, or Sand-Bear, called *Bhalloo-Soor*, or *Bear-Pig*, by the Hindoos, the *Arcitonyx collaris* of Cuvier, is about the size of the common badger, but stands higher upon its legs, and is at once distinguished by its attenuated muzzle ending in a truncated snout, like that of the common hog, and by its small and nearly naked tail. The whole height of this animal is about twenty inches, and the length of its tail nine inches. It has a body and limbs resembling

those of a bear, with the snout, eyes, and tail of a hog. Its ears are short, completely covered with hair, and surrounded by a slight border of white.

The individuals, a male and female, observed in the menagerie of the Governor-general at Barrackpoor by the French naturalist Duvancel, who furnished Cuvier with the materials for his description, were very shy and wild. They passed the greater part of the day buried beneath the straw of their den, in deep sleep. All their movements were remarkably slow. Though they did not altogether refuse animal food, yet they exhibited a marked predilection for bread, fruits, and other substances of a vegetable nature. When irritated, they uttered a peculiar kind of grunting noise, and bristled up the hair of their back; if still further tormented, they would raise themselves upon their hind-legs like a bear, and appeared, like that animal, to possess great power in their arms and claws.

This is confirmed by Mr. Johnson in his "Sketches of Indian Field-Sports." "Badgers in India," says he, "are marked exactly like those in England, but they are larger and taller, and exceedingly fierce, and will attack a number of dogs. I have seen dogs that would attack a hyena or wolf, afraid to encounter them. They are scarce, but occasionally to be met with among the hills. In their nature they resemble the bear."

The Anakuma Badger, *M. Anakuma*, described by Temminck and Schlegel, is found in Japan. Its colors are disposed in nearly the same manner as those of the European badgers, but the bands of the head, instead of being white, are of a light red. The reddish tint prevails also over the lower parts of the body, instead of the grayish brown. It inhabits mountainous countries covered with forest, lives in burrows, is nocturnal in its habits, and feeds on frogs, lizards, earth-worms, and vegetables.

Genus HELICTIS: *Helictis.*—This embraces three species of small animals nearly plantigrade, resembling the badger, but of the size of the martens. The Musked Helictis, *H. moschata* of Gray, is found in Pegu and China; the Nepaul Helictis, *H. Nipalensis*, is found in Nepaul; and the Oriental Helictis, *H. Orientalis*, is found in Sumatra. The two last were formerly ranked with the gluttons: their habits are little known.

Genus MYDAUS: *Mydaus.*—Of this there is a single species, the Javanese Skunk, the Teledu or Seng-gung of the Javanese; the *Teleggo* of the inhabitants of Sumatra; *Mephitis Javanensis* of Raffles; *M. telagon* of Gervais, and *M. meliceps* of Cuvier. It is twelve inches long; its tail two inches, with a pencil of hairs at the tip; form attenuated, like that of the polecat; feet plantigrade; claws long and strong, proper for digging; color blackish brown, marked with white or fawn on the head and back. It has two glands half an inch long, beneath the rectum, which secrete a disgusting odor like that of the skunks.

It is found in Sumatra and Java, especially in the mountains and ridges of the latter which are cultivated for the production of wheat and European vegetables and fruits, such as potatoes, cabbages, peaches, and strawberries, in a deep vegetable mould. Here the teledu ranges, and in its search for food injures the plantations and destroys the roots. It turns up the earth with its nose like a hog, and thus leaves vexatious traces of its nocturnal visits.

The dwelling of the animal is formed at a slight depth beneath the soil, under the roots of a large tree, where it constructs a globular chamber several feet in diameter, smooth and regular; there is a subterraneous approach to it about six feet long, the external entrance to which the animal conceals with twigs and dry leaves. Here it remains hidden during the day, and at night comes forth to seek the insects and their larvæ, and common earth-worms, which are its food. It is said to live in pairs, and the female produces two or three young at a birth, according to the accounts of the natives.

The fetid matter, which they cannot propel beyond a distance of two feet, is very volatile, and spreads its effluvia to a great extent. The entire neighborhood of a village is sometimes infected by the odor of an irritated teledu; and it is so powerful in the immediate vicinity of the discharge, as to produce syncope in some persons.

Dr. Horsfield describes the manners of this species as by no means ferocious, and states that if taken young it might, like the badger, be easily tamed. He kept one some time in confinement: it became gentle, and never emitted its offensive smell. He carried it with him from

Mount Prahu to Blederan, a village on the declivity of that hill, where the temperature was more moderate. It was tied to a small stake, and moved about quietly, burrowing the ground with its snout and feet, as if searching for food, without noticing the bystanders or making violent efforts to disengage itself. It ate voraciously of earth-worms which were brought to it, and held one extremity of a worm in its claws while its teeth were employed in tearing the other. After it had eaten ten or twelve, it became drowsy, made a small groove in the earth, in which it placed its snout, and, having deliberately composed itself, soon slept soundly.



THE SKUNK.

Genus MOUFETTE, or SKUNK : *Mephitis.* — The animals of this genus are confined to America—the *Zorilla* of the Cape and *Mydaus* of the Asiatic islands, sometimes called skunks, really belonging to other and distinct genera. Three species are known in the United States, and several in Mexico and South America. Thus the race extends from Hudson's Bay to the Straits of Magellan. They resemble the badgers in being nearly plantigrade, and having the anterior claws long and adapted for digging. There is a similarity also in the distribution of the colors, the dark shades forming the ground, and the light ones the markings. The hair of the body is long, and still longer on the tail, which being carried erect, has a plume-like appearance. Some of the species burrow in the ground, and others live in the fissures of rocks, several of them often associating together. They subsist chiefly on birds' eggs, insects, small quadrupeds, and poultry; they also add frogs, mice, and lizards to their bill of fare when opportunity offers. Their size is about that of the badger. They move slowly, and seldom attempt to escape from man by flight. The form is elegant, and the colors, disposed in longitudinal bands, are strikingly contrasted. These circumstances, with the long, flowing hair, would give these animals a beautiful appearance, were not all agreeable associations rendered impossible by their abominable stench. The great distinction of the genus is the possession of two glands beneath the anus, from which they eject, to a considerable distance, a liquid possessing the revolting odor of the polecat, with a suffocating and overpowering smell of garlic. This is alike intolerable to man and animals. Dogs retreat from this abominable liquid, vomiting and rolling themselves, as if in agony, on the earth, and it is said even cattle bellow with distress when the air is strongly impregnated with it. A skunk will taint the atmosphere for half a mile in every direction, and clothes infested by the liquid are ruined, as they never part with the disgusting fragrance. This gift is the animal's shield and buckler, and nature, in her infinitely diversified arts of defense, appears nowhere—not in trenchent teeth, or rending claws; not in overpowering strength, or ferocity, or even deadly venom—

to have provided any creature with more effective protection than is bestowed by this syringe upon the skunk. We surely cannot doubt the fertility of nature's resources when we find a whole race of animals enjoying life, liberty, and a free pass, through motives addressed exclusively to the nose. It may indeed be said that all this belongs rather to the ridiculous than the sublime, and that the skunk—four-legged or otherwise—is always and everywhere an object of mingled aversion and contempt. The reply is, that being what he is, he doubtless enjoys his privilege, and may be supposed even to triumph in the general disgust he excites among those who are not of his genus.

The Common Skunk of the United States, *Mephitis Americana*, or *Mephitis chincha*, or *Viverra putorius*—the *Seecawk* of the Cree Indians, the *Fiskatta* of Kalm, or, according to Charlevoix, the *Enfant du diable*—has a body about seventeen inches long, with a tail, including the long hair, twelve inches. The head is small, the forehead rounded, the body long, fleshy, and widening toward the hips; fur long and coarse, with long, glossy hairs intermixed; eyes small, ears short and rounded; feet broad, and nails of the fore-feet strong, curved, and sharp. The two anal glands are situated on each side of the rectum; the sack is supposed to contain about three drams of the offensive liquid. When this is ejected, the tail is carried forward and nearly laid on the back. An experienced person, perceiving this sign of preparation, is always careful to put himself instantly out of shooting distance. It is said that the scent is much stronger if the ejection takes place when the animal is irritated, and that it is also stronger at night than in the day-time. At night the liquid has a luminous appearance, and a stream of it has been compared to a stream of phosphoric light. It possesses a very acrid quality, and dogs and persons into whose eyes it has been thrown have been rendered blind.

The species vary much in the markings; indeed, as in the case of striped grasses, it is difficult to find two precisely alike. In general, the color is a blackish brown, with a narrow stripe of yellowish white along the nose to the head; a large patch of white on the nape of the neck, and extending downward in a stripe on each side of the back, and a stripe of white on each side of the tail for three fourths of its length. The tail is often tipped with white. But as we have said, these markings are variously modified. It is believed that when both parents are alike in color and markings, the young ones are similarly colored; but if the parents are dissimilar, the offspring is diversified.*

The skunk is a prolific animal, bringing forth from four to eight at a birth. Sometimes as many as fifteen skunks have been found in one burrow. During the winter, in the cold parts of the country, these animals keep close in their burrows, in a dozing but not torpid state. At the south, they are active the year round. They are cleanly in their habits, and never suffer themselves to be soiled by their own effluvia any more than the rattlesnake by his own venom. Some wild animals, as well as Indians, make prey of the skunk, and we have read in the pages of a distinguished naturalist a recommendation of it as "well tasted and savory." This is a common animal in nearly all the Atlantic States: depending upon its peculiar battery for defense, it is often seen walking slowly along, its tail erect, with an air of conscious security or impudent defiance, and if it perceives a man it does not always take the trouble to get out of his way; the man is most likely to beat a retreat; indeed, a brave man is quite as likely to run from a skunk as a lion. The fetid liquid is ejected in small streams, sometimes to the distance of fourteen feet, and usually with great accuracy of aim. As we have stated, the odor is stronger at night than during

* The following careful description is from Sir John Richardson's *Fauna Boreali-Americana:* "The skunk is low on its legs, with a broad fleshy body, white forehead, and the general aspect rather of a wolverene than of a marten; eyes small; ears short and round. A narrow white mesial line runs from the tip of the nose to the occiput, where it dilates into a broad white mark. It is again narrowed, and continues so until it passes the shoulders, when it forks, the branches running along the sides, and becoming much broader as they recede from each other. They approach posteriorly, and unite on the rump, becoming at the same time narrower. In some few specimens the white stripes do not unite behind, but disappear on the flanks. The black dorsal space included by the stripes is egg-shaped, the narrow end of which is toward the shoulders. The sides of the head and all the under parts are black. The hair on the body is long. The tail is covered with very long hair, and has generally two broad longitudinal white stripes above on a black ground. Sometimes the colors of the tail are irregularly mixed; its under surface is black. The claws on the fore-feet are very strong and long, being fitted for digging, and very unlike those of martens."

the day. In many of the New England villages, the perfume of the skunk and the cry of the whippoorwill are a frequent summer-evening serenade. The animal lives in the woods and thickets, but not unfrequently approaches the habitations of men, and even domiciliates himself in the barns, where he makes sad havoc among the eggs and chickens. We have even heard of one that got into a cellar one night, and being discovered by the house-maid—who, by the way, was brave as a lion in defense of the threshold—she fell upon him and killed him. Such was the stench which followed, that the woman was violently ill for several days, and the meat, bread, and vegetables in the cellar were so impregnated as to be utterly ruined.

Old Lawson's description of the skunk is alike humorous and truthful. He says: "Polecats, or skunks, in America are different from those in Europe. They are thicker and of a great many colors; not all alike, but each differing from another in a particular color. They smell like a fox, but ten times stronger. When a dog encounters them they make urine, and he will not be sweet again in a fortnight or more. The Indians love to eat their flesh, which has no manner of ill smell when the bladder is out. I know no use their furs are put to. They are easily brought up tame."

Catesby, in his Carolina, says: "When one of them is attacked by a dog, to appear formidable it so changes its usual form, by bristling up its hairs and contracting its length into a round form, that it makes a very terrible appearance. This menacing behavior, however, insufficient to deter its enemy, is seconded by a repulse far more prevailing; for from some secret duct it emits such fetid effluviums, that the atmosphere for a large space round shall be so infected with them that men and other animals are impatient till they are quit of it. The stench is insupportable to some dogs, and necessitates them to let their game escape; others, by thrusting their noses into the earth, renew their attacks till they have killed it; but rarely care to have more to do with such noisome game, which for four or five hours distracts them. The Indians, notwithstanding, esteem their flesh a dainty; of which I have eaten and found it well tasted. I have known them brought up young, made domestic, and prove tame and very active, without exercising that faculty which fear and self-preservation perhaps only prompts them to. They hide themselves in hollow trees and rocks, and are found in most of the northern continent of America. Their food is insects and wild fruit."

Sir John Richardson states that the noisome fluid which the skunk discharges is one of the most powerful stenches in nature, and so durable, that the spot where a skunk has been killed will retain the taint for many days. He quotes Graham for the fact that several Indians lost their eye-sight in consequence of inflammation produced by this fluid having been thrown into them by the animal. "I have known," says he, in continuation, "a dead skunk, thrown over the stockades of a trading-post, produce instant nausea in several women in a house with closed doors upward of a hundred yards distant. The odor has some resemblance to that of garlic, although much more disagreeable. One may, however, soon become familiarized with it; for, notwithstanding the disgust it produces at first, I have managed to skin a couple of recent specimens by recurring to the task at intervals. When care is taken not to soil the carcass with any of the strong-smelling fluid, the meat is considered by the natives to be excellent food."

The anecdotes of persons who have suffered from ignorant attacks upon this animal are numerous and some are laughable. I knew, some forty years ago, a Frenchman who lived on the great thoroughfare between Hartford and Wethersfield, Conn., where he had a considerable farm. One evening, coming along the street of Wethersfield—which, by the way, as everybody knows, is renowned for its immense product of onions—on his way homeward, he saw a pretty little animal running in the path before him. This was in fact a young skunk, but which the Frenchman mistook, in the dark, for a kitten. He rushed upon it, seized it, and put it in his pocket. On his arrival among his family, there was a general outcry at the infernal odor he brought with him, upon which he took out the little animal from his pocket, and which was evidently the cause of the disturbance. "What is it?" said one; and "What is it?" said another; for the family were all French, and were not initiated in our Yankee natural history. "I should think by the smell of garlic," said the Frenchman, "that it must be a Wethersfield kitten!"

A still better story has been often told, in which the celebrated Dr. Lyman Beecher was the

hero. When settled in Litchfield, in the earlier days of his long and useful career, he was one evening returning home, carrying with him a quarto volume of Ree's Encyclopedia, then in course of publication in Philadelphia, and regarded as the Herculean enterprise of the American press for the dawning nineteenth century. As he went along, he saw before him a skunk, which, instead of hurrying its pace, or getting out of the way, seemed rather defiantly to flourish his tail and linger in the path. Upon this, the Reverend Doctor hurled the Cyclopedia at him, in revenge of which the skunk opened his battery, and took the imprudent and astonished divine between wind and water. Doctor Beecher reached home in a dreadful plight, and it may well be guessed that he did not forget the incident. Some years after, an abusive pamphlet was published against him by some sectarian, and the doctor was advised to reply to it. "No, no," said he, with equal wit and good sense; "no; I once discharged a quarto at a skunk and got the worst of it. I am not likely to try it again."

It is said that inhaling skunk's odor has been prescribed with good effect in asthmatic affections: in one instance, however, a man who had taken it for this malady, and was benefited, was so impregnated with the smell as to be offensive to himself and his friends. On its being recommended to him a second time, he declined taking it, saying the remedy was worse than the disease. In another case, a clergyman affected with asthma had a bottle of skunk's liquid, which he uncorked and put to his nose, when he was attacked with a paroxysm. One day, while preaching, he felt an attack, and so opened his bottle and took a whiff. Instantly the whole sanctuary was filled with the effluvia, and the congregation spontaneously took to flight: a melancholy evidence, no doubt, alike of the levity of sinners and the strength of the odor, inasmuch as even the "wrath to come" was forgotten in a present momentary disgust. It appears that good old Father Charlevoix, in christening this animal the "Child of the Devil," had theological as well as sentimental grounds for the piquant nomenclature.



CALIFORNIA SKUNK.

The Texan Skunk, the *M. mesoleuca* of Litchtenstein, and *M. nasuta* of Bennett, resembles the common skunk in form, size, and habits. The whole of the back, from the forehead to the rump, and including the tail, is covered with white hair, extending half down the sides; the under parts are a blackish brown. The line of division between the light and dark colors is so sharply defined as to give the animal the appearance of having two distinct sorts of skin. It is found on the

sedgy plains and in the woods of Texas and Mexico, its retreats being hollows beneath the roots of trees, holes in the fallen trunks, or cavities in rocks. Its food consists of grubs, beetles, and other insects, with eggs, birds, and small quadrupeds. It is quite destructive to the poultry on the plantations.

This animal is shy and timid, but does not ordinarily attempt to escape from man, unless it chances to be near its burrow. Its white, bushy tail, being carried erect, often betrays it to the hunter, even when the body is concealed in the grass.

The California Skunk, or Zorilla, *Mephitis zorilla*, resembles the preceding, but is smaller, being but about a foot long. It lives in holes in the earth, or beneath the roots of trees, or in crevices of the rocks, and feeds on insects, birds, and small quadrupeds. It has an offensive odorous liquid similar to that of the common skunk. It is found in California. This is to be distinguished from the African zorilla, which will be noticed hereafter.

The three species of skunks which we have thus described are the only ones found in the United States; of the more southern species we have few well-authenticated details, and can give little more than names. Among them there are the *M. mesomelas*, *M. interrupta*, *M. varians*, and *M. Mexicana*, all found in Mexico; a species bearing the local name of *Mapurito*, found in New Granada; the *M. quitensis*, the *Gulo quitensis* of Humboldt, found in Peru; the *M. Feuillei*, found in the vicinity of Montevideo; the *M. Chilensis* of Chili, and the *M. Castania*, a small species found in the more southern portions of South America. It is possible that all these are not entitled to the rank of distinct species, and there are no doubt other species of which we have no very reliable accounts. All these, whether species or varieties, have a general resemblance to the kinds we have described, the chief differences being in size and the distribution of the light and dark colors. The signal quality of each is that which characterizes the genus—the possession of the peculiar fetid odor for a weapon of defense.

THE MUSTELINS.

This tribe includes a number of very remarkable species, several of which are of considerable size and heavy mould, in these respects resembling the badgers; others are much smaller, but of great activity and energy, and all are in the highest degree carnivorous and voracious.

Genus GLUTTON: *Gulo.*—Of this there is a single species, the Glutton of Europe and Wolverene of the United States. It furnishes a curious instance of the diversity of names which have been bestowed on a single animal, not merely in different languages, but by different writers. It is the *Gulo luscus* of Linnæus; the *Carcajou* of the French Canadians; the *Carcajou-kinkajou* of Charlevoix; the *Quickhatch* of Ellis and others; the *Quiquihatch* of Graham; the *Kablee-arioo* of the Esquimaux; the *Naghai-eh* of the Chippeways; the *Okeecoohawgees* of the Algonquins; the *Rosomak* of the Russians; the *Timmi* of the Kamtschatkans; the *Ursus gulo* of Pallas; the *Taxus gulo* of Tiedemann; *Gulo arcticus* of Desmarest; *Gulo vulgaris* of Griffith and Cuvier, to which we may add the *Quadruped vulture* of Buffon. The name of Glutton, which is the prevalent one, it is said, originated in a blunder, but mankind suited the description to the title they had given it. The name of this animal in the Finnish language is *Fiæl-Frass*, which means a "dweller among rocks." The Germans popularized this into *Vielfrass*, which means a *gormandizer*, a *glutton*. The old writers, in the days when fiction was as good as fact, had no difficulty in making up stories to justify the terrible name which the animal had thus acquired. Accordingly, Olaus Magnus said, "It is the custom of this creature, when it has found the carcass of some large beast, to eat until its belly is distended like a drum, when it rids itself of its load by squeezing its body betwixt two trees growing near together, and again returning to its repast, soon requires to have recourse to the same means of relief."

Other writers followed in a similar vein, and to this charge of disgusting voracity, added the attribute of the most wonderful craft and dexterity. It was said to climb trees, and throw down moss which the reindeer is fond of, and when they were enticed within reach, the glutton would pounce upon their backs and destroy them. Even Buffon was led to adopt these romances. He says of this creature: "The defect of nimbleness he supplies with cunning: he lies in wait for animals as they pass; he climbs upon trees in order to dart upon his prey, and seize it with advan-



THE GLUTTON.

tage; he throws himself down upon elks and reindeer, and fixes so firmly on their bodies with his claws and teeth that nothing can remove him. In vain do the poor victims fly and rub themselves against trees; the enemy attached to the crupper or the neck continues to suck their blood, to enlarge the wound, and to devour them gradually and with great voracity, till they fall down dead."

Buffon, however, though sometimes seduced into exaggeration by the marvelous facility of his style and the lavish flow of his imagination, belonged to an age when what had been said was not considered as, of course, done; *authority* was not the exclusive guide, at least in matters of science, and therefore his inquiries went behind what was written, the question being, *What is the truth?* Thus he not only corrected many errors of those who had gone before him, but even, in some cases, recanted his own. In regard to the glutton, in a supplementary chapter, he gives an account of one he had actually seen, as follows: "He was so tame that he discovered no ferocity, and did not injure any person. His voracity has been as much exaggerated as his ferocity; he ate, indeed, a great deal, but when deprived of food he was not importunate. He is rather wild, avoids water, and moves with a kind of leap. After eating, he covers himself in the cage with straw. In drinking, he laps like a dog. If indulged, he would devour more than four pounds of flesh in a day; he swallows his food voraciously, and almost without chewing." Such is the plain, unvarnished tale, told from observation. How different from the loose narrations of the "old authors."

The wolverene is found in all the high northern latitudes of both continents. It is common in Canada, and even in Michigan, and thence northward to the Polar Sea, its range extending from Davis' Straits on the east, to the islands of Alaska on the west. The body of the animal is about two feet and a half long; the head is broad and compact, suddenly rounded off on every side to form the nose; jaws resembling those of a dog in shape; back arched; tail low and bushy; legs thick and short; the whole aspect indicating strength without much activity. Fur generally dark brown, passing in the height of winter almost into black. A pale reddish-brown band, more or

less distinct, and sometimes fading into soiled brownish white, commences behind the shoulder, and running along the flanks turns up on the hip and unites with its fellow on the rump; the short tail thickly covered with long black hair; some white markings, not constant in size or number, on the throat and between the fore-legs; legs brownish black; claws strong and sharp. In walking, it places its feet on the ground much in the manner of a bear, and imprints a track on the snow or sand which is often mistaken for that of the bear by Europeans on their first arrival in the fur countries; but the Indians distinguish the tracks at the first glance by the length of the steps. The female produces from two to four once a year, the cubs being covered with a downy fur of a pale cream-color. The reputation of the wolverene for voracity is not wholly unwarranted. It feeds on the carcasses of animals it meets with which have been killed by accident; it devours mice, marmots, hares, and other rodentia. It is said to be a great destroyer of beavers. Mr. Graham informs us that the wolverenes are extremely mischievous, and that they do more damage to the small fur-trade than all the other animals conjointly. They will, he states, follow the marten-hunter's path round a line of traps extending forty, fifty, or sixty miles, and render the whole unserviceable, merely to come at the baits, which are generally the head of a partridge or a bit of dried venison. They are not fond of the martens themselves, but never fail of tearing them in pieces, or of burying them in the snow by the side of the path, at a considerable distance from the trap. Drifts of snow often conceal the repositories thus made of the martens at the expense of the hunter, in which case they furnish a regale for the hungry fox, whose sagacious nostril guides him unerringly to the spot; and two or three foxes are often seen following the wolverene for this purpose.

Sir John Richardson says: "This animal is so suspicious, that it will rarely enter a trap itself, but beginning behind, pulls it to pieces, scatters the logs of which it is built, and then carries off the bait. It feeds on various small animals, and occasionally on disabled quadrupeds of a larger size. I have seen one chasing an American hare, which was at the same time harassed by a snowy owl. It resembles the bear in its gait, and is not fleet; but it is very industrious, and no doubt feeds well, as it is generally fat. It is much abroad in the winter, and the track of its journey in a single night may be often traced for many miles. From the shortness of its legs, it makes its way through loose snow with difficulty, but when it falls upon the beaten track of a marten-trapper, it will pursue it for a long way. It is reported to defend itself with boldness and success against the attack of other quadrupeds, but it flees from the face of man, and makes but a poor fight with a hunter, who requires no other arms than a stick to kill it."

Sir James Ross gives a striking instance of the boldness of the species when urged by famine. "At Victoria Harbor, in the middle of the winter, two or three months before we abandoned the ship, we were one day surprised by a visit from one, which, pressed hard by hunger, had climbed the snow-wall that surrounded our vessel, and came boldly on deck, where our crew were walking for exercise. Undismayed at the presence of twelve or fourteen men, he seized upon a canister which had some meat in it, and was in so ravenous a state, that while busily engaged at his feast he suffered me to pass a noose over his head, by which he was immediately secured and strangled. By discharging the contents of two secretory organs, it emitted a most insupportable stench. These secretory vessels are about the size of a walnut, and discharge a fluid of a yellowish-brown color, and of the consistence of honey, by the rectum, when hard pressed by its enemies."

The skin of the wolverene is valued in Kamtschatka, the women dressing their hair with its white paws, which they esteem a great ornament. That of the Asiatic and European variety is much finer, blacker, and more glossy than the American ones, the latter resembling the fur of a black bear.

Genus RATEL: *Mellivora*, or *Honey-Eaters*.—Of this genus there are two species, the Cape Ratel, or Bharsiah, and the Indian Ratel. Of the former, *M. Capensis* of Cuvier, the hair is rather smooth, but stiff and wiry; body above, from the top of the head to the root of the tail, dull ash-gray, whitest toward the head; muzzle, space round the eyes and ears, limbs, all the under parts, and rest of the tail, black; claws on the fore-feet long, the middle three longest, the internal claw placed much more backward than the rest; bulk about that of a badger; total



THE CAPE RATEL.

length three feet, the tail about a sixth of this length; height about ten or twelve inches. The hide is tough and loose, like that of the badger, so that, if any one catches hold of it by the back part of the neck, it is able to turn round in its skin, and bite the offending arm. The claws of the fore-feet are particularly well formed for grubbing. The teeth consist of six incisors common to nearly all carnivorous quadrupeds, two canines and eight cheek teeth in each jaw.

With respect to the habits of these animals, we can do little more than give an abstract of Sparrman's version of the relations of the Hottentots and of the Dutch colonists, which has been adopted by all subsequent authors. The bees, according to this author, furnish the ratel with his principal, if not his only, means of subsistence. These insects are accustomed to take up their abode in holes in the earth, formed by various burrowing quadrupeds, and the ratel is endowed with peculiar sagacity for discovering their nests, which it undermines with its powerful claws, in order to feast upon the honey contained in them. Aware that sunset is the period at which the bees return to their homes, it chooses that time for making its observations, which are conducted in a very curious manner. Seated upon the ground with one of its paws raised, so as to shade from its eyes the rays of the declining sun, it peers cautiously on either side of this singular kind of parasol, until it perceives a number of bees flying in the same direction. These it carefully marks, and follows in their track until it has safely lodged them in their nests, which it immediately commences pillaging. But if it should happen that, contrary to their usual custom, they have built in the hollow of a tree, the ratel, being unable to climb, and angry at its disappointment, wreaks its vengeance upon the senseless stock by biting around it, and the Hottentots know well that such marks on the trunk of a tree are certain indications of a bee's nest being contained within it.

It is added, that the ratel, as well as the native inhabitants of the neighborhood of the Cape, is sometimes guided in this search after honey by a little bird, the honey-cuckoo, which it seems has sagacity enough to know that both men and beasts are fond of the tempting spoil. This little creature, although incapable of storming a hive in its own person, takes advantage of the propensity that exists in others who are better fitted for the task, and invites the Hottentot or the

ratel to follow it, by a peculiar note, which they both equally understand. Having thus secured their attention, it flies slowly on before them, alternately halting for them to come up with it, and then taking another flight, still admonishing them by its warning voice, until it arrives at the spot where the hidden treasure is deposited. Then it suddenly ceases to be heard, but remains quietly perched on a tree in the vicinity, waiting for a share of the plunder, which it usually receives as a reward for its interested service.

In such an assault upon an angry swarm, the toughness of the ratel's hide must be a most effectual defense, and it is even stated that so difficult is it to penetrate its skin, that a pack of dogs that would be sufficient to dispatch a moderate sized lion, have sometimes failed in their attack upon this comparatively insignificant animal. Such is its tenacity of life, that, as Mr. Barrow states, "it is a species of amusement for the farmers to run knives through different parts of its body without being able for a length of time to deprive it of existence." Major Denham was, however, informed by the natives of Central Africa, where it is also found, that a single blow on the nose is sufficient to destroy it almost instantaneously, which may probably be owing to the thinness of the skull adjoining the *ossa nasi*. In the same regions it has obtained credit for so much ferocity as to be said, at certain seasons, to venture singly to attack a man.

On the whole, we are inclined to doubt the marvelous parts of Sparrman's account of the ratel: that it feeds on honey, and has acute instincts in finding and obtaining it, is very likely; but that honey is its chief food is by no means probable. The dentition of the animal shows it to be in a high degree carnivorous, and we very readily believe, that, like its Asiatic congener, which we shall soon describe, it diversifies its repasts with flesh when it comes in its way.

Mr. Bennett well observes that the dentition of the ratel is much at variance with the diet attributed to him in the accounts we have recited, and that their accuracy may fairly be doubted. "It requires," says he, "the most positive evidence to convince us that an animal, the number and disposition of whose teeth correspond more closely with those of the cats than any other quadruped with which we are acquainted, and exhibit a carnivorous character scarcely, if at all, inferior to that which is evidenced by the same organs in the hyenas, should subsist entirely, as from these accounts we are left to believe, upon the petty rapine of a hive of bees, and the honeyed produce of their comb. Still, there exist such decisive marks of a diminished capacity for preying on animal food, in the thick-set and clumsy form of its body, the shortness of its limbs, its partially plantigrade walk, the structure of its muzzle, and even in the form of the teeth themselves, as to induce us to pause before we determine to reject the popular testimony as unworthy of credit, although we must regard it as doubtful on some particular points, and insufficient and imperfect on the whole." This animal inhabits the Cape of Good Hope.

The Indian Ratel, *M. Indica*, held by some naturalists to be a mere variety of the preceding, appears to resemble it very closely in appearance. It is found in several parts of India, especially along the high banks bordering the Ganges and the Jumna, and our accounts of it are more reliable than those we have of the African species. It rarely issues forth by day, but prowls about at night among the habitations of the Mohammedan natives, scratching up the recently buried bodies of the dead, unless they are protected by thorny bushes, placed over them for this purpose. It burrows with such celerity, that it will work itself under cover in the hardest ground in ten minutes. The natives sometimes dig them out of their holes, and take them alive. The old ones are secured with difficulty, and seldom live long in captivity; the young, on the contrary, are docile and playful. In confinement, their general food is flesh, in any and every state; but birds and rats seem to be particularly acceptable. They are fond of climbing, but perform this operation in a clumsy manner. They sleep much during the day, but become watchful at night, and manifest uneasiness by a hoarse call or bark. A species of this kind of ratel was one of the earliest members of the collection in the London Zoological Gardens, and was particularly playful and good-tempered, soliciting the attention of every visitor by throwing its clumsy body in a variety of postures, and tumbling head over heels with every symptom of delight. Toward animals its manner was entirely different, displaying a cat-like eagerness in watching the motions of the smaller species, and they, in return, exhibiting an instinctive dread when they perceived or approached it. Its food consisted of bread and milk in the morning, and flesh later in the day.

Genus GALICTIS, *Galictis*, contains two species, the GRISON and the TAÏRA. The former, *G. vittata*, the *Viverra vittata* of Linnæus, and *Guiana marten* of Buffon, in its general color is nearly black, but gray on the top of the head and beneath the throat, with a yellowish band along the back, and descending on either side to the shoulders. It is nearly plantigrade, is highly carnivorous, and inhabits the woods throughout a large part of South America.

The TAÏRA, *G. barbara*, the *Mustela barbara* of Linnæus, the *Taïra* or *Galera* of Buffon, is larger than the preceding, and is of a blackish-brown color, the fore-parts shaded with gray; there is also sometimes a light spot on the throat, and the back part of the neck. It is a burrowing animal, and diffuses a musky odor. The body is long, and the strength great for the size. It is found in Guiana, Brazil, and other parts of South America. A specimen was presented to the London Zoological Society from Peru; this was gentle and playful, and displayed the same aversion to water as a cat.

Genus MARTEN: *Mustela.*—This includes several remarkable species, all of which climb with facility, and having long, lithe bodies, with short legs, are able to enter holes and wind through passages from which even the smallest cats are excluded. They are all endowed with voracious appetites, and devour great numbers of eggs, birds, and small quadrupeds. Some of them introduce themselves into the poultry-yards, and make immense havoc among the feathered inhabitants. Most of them are noted for their valuable peltry, and some produce the finest and most luxurious furs that are known. Though nearly allied to the weasels and polecats, which are distinguished for their offensive odor, the martens only diffuse a musky and not disagreeable scent.



MARTEN. WEASEL.

The COMMON MARTEN OF EUROPE, *M. martes*,—*M. Foina* of Linnæus; the *Beech Marten* and *Stone Marten* of the English; the *Fouine* of the French; *Foina* and *Fouina* of the Italians; *Hauss Marder* and *Stein Marder* of the Germans,—is found in Northern and temperate Europe and Western Asia, but not in America. Its head is somewhat triangular, the muzzle pointed, the eyes prominent and lively; the body much elongated and very flexible; the tail long, thick, and bushy; the toes naked, but at times, probably in the winter, covered beneath with thin soft

hair. The fur is of two sorts—the inner extremely soft, short, copious, and of a light yellowish-gray color; the outer very long, shining, ash-colored at the roots, brown at the extremity, but of different degrees of intensity at different parts of the body; the middle of the back, the tail, the outer parts of the legs and the feet, being darker than the other parts; the belly lighter and more gray; the throat white. Length of head and body one foot six inches; of the tail, nine inches six lines.

This marten is found more remote from woods, though it is often met with in them, and more frequently in mountainous and stony places, and nearer the habitations of man than the pine marten. It prefers the vicinity of farm-yards and homesteads, and is a ruinous visitor to them and the game-preserve. It is an expert climber, and is lively, active, and graceful in its movements. The nest of the female is constructed of herbage, straw, or grass, sometimes in the hollow of a tree, sometimes in the crevices of rocks, not unfrequently in a ruin, and occasionally in granaries or barns. The fur is considered very far inferior to that of the pine marten, and is known in the trade as the skin of the *Stone Marten*. Many are imported from the north of Europe, and dyed to represent sable. The comparatively poor quality of the fur, however, is immediately perceptible to the experienced eye, although, as is the case with most of the animals which are used for their fur, the northern skins are fuller, richer in color, and more lustrous than those from more temperate climates.

The Pine Marten, *Martes abietum*, the *Mustela martes* of Linnæus.—Of this species the general color is brown, though as in the case of the preceding, subject to variation in the depth of the tint; throat yellow; toes naked beneath; legs longer and head smaller than in the beech marten. This is the *Marte* of the French; *Marta*, *Martura*, *Martora*, and *Martorello* of the Italians; *Marta* of the Spanish; *Feld-Marder* and *Wild-Marder* of the Germans; *Marter* of the Dutch; *Wawpeestan* of the Cree Indians; *Wawbeechins* of the Algonquins; *Sable* of the American Fur-Dealers, though Dr. DeKay thinks the American sable a distinct species; and *Marten* of the Hudson's Bay Company's Lists. It is found in Europe and North America. In its habits it resembles the beech marten in many respects, but it shuns the neighborhood of man—living in Europe in deep forests, and preying on birds and the smaller animals. The female deposits six to eight young ones, in a nest of moss and leaves, formed in some hollow tree, when she does not take possession of that of the squirrel or the woodpecker.

In America it inhabits the woody districts in the northern parts, from the Atlantic to the Pacific, in great numbers, and has been observed to be particularly abundant where the trees have been killed by fire, but are still standing. It lives in the trees, is nocturnal in its habits, and destroys great numbers of the smaller squirrels. "It is very rare," says Richardson, "as Hearne has remarked, in the district lying north of Churchill River and east of Great Slave Lake, known by the name of Chepewyan or Barren Lands. A similar district, on the Asiatic side of Behring's Straits, twenty-five degrees of longitude in breadth, and inhabited by the Tchutski, is described by Pennant as equally unfrequented by the marten, and for the same reason, the want of trees. The limit of its northern range in America is like that of the woods, about the sixty-eighth degree of latitude, and it is said to be found as far south as New England. Particular races of martens, distinguished by the fineness and dark colors of their fur, appear to inhabit certain rocky districts. The rocky and mountainous but woody district of the Nipigon, on the north side of Lake Superior, has long been known for its black and valuable marten-skins." It might have been added that this animal is found as far south as Pennsylvania.

The same author gives the length of the head and body at from eighteen to twenty inches, and notices a remark of the natives that the fur loses all its luster, and consequently much of its value, upon the falling of the first shower of rain for the season. He further states that this animal preys on mice, hares, and partridges, and in summer on small birds' eggs, &c. A partridge's head, with the feathers, is, he says, the best bait for the long-traps in which it is taken. It does not reject carrion, and often destroys the hoards of meat and fish laid up by the natives, when they have accidentally left a crevice by which it can enter. When its retreat is cut off, it shows its teeth, sets up its hair, arches its back, and hisses like a cat. It will seize a dog by the nose and bite so hard, that, unless the latter is well used to the combat, it escapes. Easily tamed,

it soon becomes attached to its master, but is not docile. The flesh is occasionally eaten, but not prized, by the Indians. The females are smaller than the males, go with young about six weeks, and produce from four to seven at a time, about the end of April. According to Mr. Graham, this marten is sometimes troubled with epilepsy.

The fur of this animal is much esteemed, and the exportation of skins from the territories of the Hudson's Bay Company and Canada is very great.

The Pekan, Fisher, or Pennant's Marten, *M. Canadensis*, popularly called *Black Fox* and *Black Cat* in some parts of the United States, has a head somewhat resembling a cat, eyes small and oblique, body long, and formed for agility and strength; general color grayish brown; length of the body twenty-four inches. It runs with rapidity, and climbs trees with facility. When attacked by dogs it fights ferociously. Though nocturnal in its habits, it is frequently seen abroad in the day. It prefers low, swampy ground, and being partially web-footed, probably preys occasionally on fish: it generally feeds on mice, rabbits, grouse, and the like. It is said to have received the name of *Fisher* from a taste for fish used to bait traps. Richardson says it eats frogs, and he was informed that it had a fondness for the Canada porcupine, which it kills by turning it over and biting it on the belly. It is found from Virginia to the Great Slave Lake. It was very abundant in New England in the early periods of its history, but is now comparatively rare.

The Japanese Sable, *M. melanopus*, is little known.

It may be remarked that some uncertainty and confusion exist as to several species of martens. The pine marten is generally regarded as the American sable, but, as already remarked, Dr. DeKay held a different opinion. Gervais mentions the Pekan and Pennant's marten as distinct species, and several authors speak of the *Huron Marten*, *M. Huro* of Cuvier, as a distinct species, while it is no doubt a mere variety of the pine marten.

The Sable, or Zibeline Marten, *M. zibellina;* the *Sobol* of the Poles and Russians.—This is by far the most highly esteemed of all the martens; it ranks higher in respect to its fur than even the ermine. In form and size it does not differ greatly from the other martens, and there is also a slight resemblance in the character of the fur, though that of the martens is very inferior in all those qualities which are valued in furs. Though the fact is sometimes stated otherwise, the teeth of the sable are of exactly the same character as those of the martens, which indicates the same kind of living, and the capacity of partially subsisting upon vegetable matter when animal food is not to be had. But there is one character of the sable which points it out as belonging to a different locality, and that is, the feet being completely covered with fur down to the claws. Thus the sable is a more northerly animal than any of the martens, and much more a creature of the wilds. Accordingly, it is never met with in warm places, but only in the extremest wilds of Siberia and the vicinity, beyond the positive forests, and on the margins of the polar ice.

The skin of the sable is exceedingly valuable; and though a very small one, a single skin fetches a large price. The animal is accordingly sought after with the greatest assiduity, and it may be said, that the desire of procuring sable-skins has conduced more than any thing else to the discovery of the extreme north and northeast of Asia. It is during winter that this hunting is carried on, and it is described as being more severe than the hunting of the fur animals in America, because of the vast accumulations of broken ice, covered with snow, which skirt the shores of the sea, and contain between them the most dangerous pitfalls, concealed by snow. In America, the margin of the Polar Sea is no doubt as wild in itself as it is in Asia; but the American hunting-ground does not come up into so high latitudes as the sable ground in Siberia; and thus, though the American hunter has long roads and severe cold, he is not beset by so many dangers. We need hardly mention that the fur of the sable, in its perfection, is a rich brown, marked with some white spots on the chin and sides of the head. The part where these spots are is not as much valued as the rest, and the furriers work it up separately, and give it the name of "sable gill."

Like the ermine, the sable is subject to an annual change of color. In summer it is black, and the change to brown that it undergoes in winter naturally follows the general law of being more perfect in proportion as the cold is more severe. The cold of the sable's country, however, is sufficient every winter for accomplishing any thing that cold can accomplish, whether it reside in the

places which we have mentioned close by the Polar Sea, or on the cold heights of the mountains further south; and therefore the sable-skins obtained during the winter are more uniform in color than those of animals which inhabit less rigorous localities.

In many places in Siberia, the hunting of the sable is a duty imposed by the Russian government upon the exiles of that country; and to them, when they first enter upon it, it is the most dreadful to which human beings can be subjected. They are unacquainted with the country, and instead of knowing where to discover and how to procure the animals, of which they are compelled to find a specified number, they can hardly make their own way across rocks and chasms, fallen trees, and countless other irregularities, all hidden under the snow; and thus many of them perish in that dreadful wilderness.

The sable, as we might expect, partakes of the characters of a tree animal and a ground animal jointly. It can climb; and it is understood to climb for those wild berries which remain upon the branches in winter, as well as for birds and their eggs and young during the summer. It also hunts prey upon the ground, and though it is of course not capable of running down a hare in fair chase, it is very capable of dispatching one if it come upon it by surprise. It is also sure to follow the more powerful predatory animals, the polar bear, the wolf, and the glutton, in order to obtain a share of their prey. In its disposition it is not a ferocious animal, but can be tamed, and will show some affection in a domestic state. In this condition it subsists indiscriminately upon animal and vegetable matter, and is said not to be so prone to make its escape to the wilds as the other martens.



POLECAT ATTACKING A HARE.

Genus POLECAT, or WEASEL: *Putorius*.—This genus includes the *Weasels*, with the *Ermine* or *Stoat*, as well as the *Polecat* or *Fitchet*, and the *Ferret;* all small, but distinguished for their long, flexible bodies, and their destructive habits, surpassing even the cats in their instinct for killing other animals. All are noted for a secretion in an anal pouch, which, when they are irritated or frightened, diffuses a more or less offensive odor. They trace their prey by scent, take to the water readily, as they have semi-palmated feet, and kill by inflicting a wound in the neck. The female is commonly much smaller than the male.

The POLECAT, FITCHET, or FITCHET-WEASEL, *P. fœtidus*, the *M. putorius* of Linnæus, is the *Fulimart* or *Foumart* of the English. *Polecat* has been supposed to be a corruption of *Polish cat;* but this seems to be not much better than a guess: *Foumart* and *Fulimart* have, with better reason, been considered as contractions of *Foul Marten*, in contradistinction to the *Sweet*

Marten. It is the *Putois* of the French; *Foetta* and *Puzzolo* of the Italians; *Putoro* of the Spanish; *Iltis*, *Ulk*, and *Buntsing* of the Germans.

This animal is stouter in proportion than either the common weasel or the ermine, and the head is broader; the nose rather pointed, ears round, and not conspicuous; neck comparatively short; tail inclining to bushy, and rather more than a third of the length of the body and head. There are two kinds of fur in this species—the short is fulvous and woolly, the long is black, brownish black, and shining. A brown color mingled with yellow, varying according to the proportions of these two sorts of fur in the individual, is the result. There are some white marks about the mouth and ears, and the parts which are darkest in color are the head, tail, and feet. The length of the head and body is seventeen inches. The anal sack, situated beneath the extremity of the rectum, contains a yellowish fetid substance of the consistence of thick cream, which has an odor inferior in intensity to that of the skunk, but still proverbial for its offensive quality.

The polecat is found throughout Europe and Western Asia, but is not a native of America. It is most destructive to the poultry-yard and the preserve; its appetite for slaughter, which seems never to be satiated as long as any living thing remains within its reach, rendering it a most ruinous neighbor to those who rear fowls or keep up a head of game. Not only the young birds fall victims to it, but the parents also; nor are even geese or turkeys safe. We have heard an instance of a hen and a whole brood of chickens being killed by one of these destroyers in a single night; and upon another occasion, seven or eight nearly full-grown turkeys. The brain and the blood seem to be the choicest portions. The bodies of the dead are carried off to its haunts, which are generally in some copse or wood near a farm, or in the heart of a preserve, whence it issues on its deadly errand in the evening, generally soon after sunset, or when it grows dusk.

No "vermin" is placed with more satisfaction upon "the Keeper's Tree," for none commits more havoc, if so much, among the game. Beginning with the egg, it persecutes all the game-birds through every period of life, and is a far more determined enemy than the stoat itself to the hare and rabbit-warren. The fox, as is well known, will do much to keep down the pheasants, and especially the rabbits and hares; but even this wily and powerful invader is not so mischievous as the species of which we are treating. Where a fox will kill one, a polecat will immolate ten, to say nothing of eggs; no vertebrated animal seems to come amiss to its murderous nature. Bewick relates that during a severe storm, a foumart was traced in the snow from the side of a rivulet to its hole at some distance from it. As it was observed to have made frequent trips, and as other marks were to be seen in the snow which could not easily be accounted for, it was thought a matter worthy of great attention. Its hole was accordingly examined, and five eels were discovered to be the fruit of its nocturnal excursions. The marks in the snow were made by the motion of the eels in the quadruped's mouth. In Loudon's Magazine is an account of a female polecat that was hunted to her nest, which held five young ones in a comfortable bed of withered grass. From a side hole the narrator picked out forty large frogs and two toads alive, but capable of sprawling only, for the old polecat had stricken them all with palsy by a bite through the brain of each! Whether she had put them in this condition as a pickle, to preserve them for future use, is not known. At all events, the fact suggests the hideously destructive nature of these creatures. The nest of this species is generally made in some rabbit-burrow, in the crevice of a rock, or where the tangled herbage and brushwood overgrow loose heaps of stones; there the female drops from four to six young in May, or early in June. The courage of the polecat is great, and none of the tribe denominated by game-keepers "vermin" so severely tries the "pluck" of a terrier; for its flexibility, unless seized in the right place and shaken to death at once, enables it to turn and fasten upon the nose of the dog, so as to make the latter not unfrequently desist from the attack. There is good evidence that the polecat will breed with the ferret. Inferior to the fur of the sable or marten, that of the polecat is nevertheless esteemed, and a considerable exportation of the skins annually takes place from the north of Europe, under the name of *Fitch.*

The Siberian Polecat, or Chorok, *M. Sibirica* of Pallas, is about the size of the ferret, and has long fur of a bright golden yellow. It is a very hardy species, and in its native country resides chiefly in the forests. Among the other species are the *Vomela*, or *Peregusna*, *P. Sarmaticus*, found in Siberia, and the *Itatsi*, *P. itatsi*, of a bright chestnut-color, and found in Japan.



POLECAT. FERRET.

The Ferret, *Viverra furo* of Shaw, the *Furet* of the French, is of a light yellowish color, different parts being more or less white, for the long fur is partly white, and the short almost entirely yellow; the eyes are pink; length of head and body fourteen inches; of the tail six inches. It is supposed to be a native of Africa, but is not found there in a wild state; it is domesticated in Europe, and, by some, is regarded as a variety of the polecat, produced partly through albinism. This, no doubt, is an error. Its habits are similar to those of the European weasels, but more blood-thirsty. Capable of a certain degree of tameness, it seldom, if ever, becomes attached, and is a dangerous inmate, unless properly secured. It has even been known to attack and cruelly lacerate an infant which had been left unguarded in its cradle, and with such ferocity that, after it had been driven away, the cries of the tortured child brought it from its hiding-place, eager to renew the attack.

This species, whose whiteness and red eyes may, perhaps, be the result of a long period of domestication, cannot bear cold, and should be kept warm to insure its healthy condition. It is said to breed twice a year in a state of domestication, unless it devours its offspring, which it sometimes does, and then it has three litters. The gestation of the female continues six weeks, and she then produces generally six or seven young—sometimes even nine. These are blind for a month, and at the end of two more are considered fit for service.

We have the evidence of history as to the southern origin of the ferret. Strabo informs us that in early times a great portion of Spain was literally eaten up on the surface, and drilled into holes like a honeycomb, by rabbits, just as many parts of the Pampas in South America are at present by the viscacha. Countries, when taken possession of by these burrowing rodents in such multitudes, are quite unprofitable to man; and scarcely any human means, indeed none which would be repaid by the advantage gained, can rid them of these pests. To bring Spain within the class of useful countries, the ferret was imported from Africa; and it has ever since been more or less preserved in Europe, not domesticated—for, to soften its disposition would be to destroy its usefulness—but a subject of the care of those who employ it. To

those who feed it, and are otherwise kind to it, it is not gratuitously savage, at least in any very high degree; but very little tampering with it angers it, and makes it bite. When angry, its odor, which is far from pleasant at any time, becomes much less so, and establishes its connection with the polecat genus.

It is considerably smaller than the polecat, being three inches shorter in the body, and one inch shorter in the tail; and it is exceedingly slender. It is very bold, however, and its disposition to kill rabbits is most inveterate. It is chiefly used for rabbit-hunting, not for killing them; for if it were allowed to do that, it would soon dispatch a whole warren, and leave the owner to dig out the dead bodies at his leisure. It is used to "unearth" them, or drive them out of their holes, and it is carefully muzzled to prevent it from biting. The rabbits are not, of course, aware of the perfect harmlessness of the muzzled ferret, and so they scamper out, and are caught, generally by terriers, which watch at the mouths of the holes, and at another time in a net, if the object is to keep the rabbits alive. It is also the very prince of rat-catchers; and, as it is not muzzled for this sort of occupation, it slaughters away in a dashing style, and might be very useful in places infested with rats, were it not for the attention and trouble which it requires. In corn-stores and mills it might be advantageously kept; and if a snug berth could always be provided for it, it would be very valuable at sea. The ferret, as is the case with most animals when transported to a climate colder than their natural one, spends a great deal of its time in sleep; but the moment that it awakens, it is in a state for action; and slender as it seems, it is capable of undergoing a great deal of fatigue.

The preceding species is only known in America as a foreign curiosity, but this continent has an indubitable species of its own. This is the Black-footed Ferret, *P. nigripes*, a rare animal, inhabiting the country bordering on the lower part of the Platte River, and thence to the Rocky Mountains. Its general color is a yellowish brown, the lower parts white; length one foot seven inches. In its habits it resembles the European species; it feeds on small reptiles and quadrupeds, eggs, and insects. It is a destructive foe to rabbits, hare, grouse, and other game.

The Java Ferret, *P. nudipes*, is little known.

Of the smaller kinds of putorius, usually called weasels, there are many species, but they are not, in all cases, well distinguished from each other. One of the most remarkable of them is the Stoat or Ermine, or Ermine-Weasel of the English and Americans, *L'Hermine* and *Roselet* of the French, the *Armellino* of the Italians, *Hermelin* of the Germans, *Seegoos* of the Cree Indians, and *Terreeya* of the Esquimaux, the *P. erminia* of naturalists. It is distinguished by the long, flexible, worm-like form, the nimble gliding movements, the sanguinary tastes and destructive habits of the genus; and, indeed, possesses all their qualities in the highest perfection. It is ten or eleven inches long, the body reddish brown above, and white beneath; extremity of the tail black. The most remarkable fact in its history is, that the dark part of its fur turns white in winter, in northern climates, but generally remains the same in southern latitudes, as in Virginia, for instance. Even in the State of New York, shades of brown frequently remain blent with the white. The change from brown to white takes place in October and November; the change from white to brown in March. These alterations are not effected by shedding the coat, but by changes in the color of the hair itself. The young are four to seven in number, and are produced in April.

The ermine is found in Middle Europe, but is common only in the North. The white are those most valued; the finest are obtained in the most northerly countries, as Russia, Norway, Siberia, Lapland, and British America. On this continent their range is very extensive, that is, from Labrador to Georgia. It is only in the high inland parts that it is met with in the Southern States. In the United States it is most common in elevated stony districts. The number of ermine-skins annually taken throughout the world must amount to several hundreds of thousands. They have long been used to decorate the robes of judicial officers in England, and has a proverbial association with ideas of moral purity. They are also much worn by ladies and children.

"It appears that in England, generally," says Mr. Macgillivray, "the ermine is less common than the weasel; but in Scotland, even to the south of the Frith of Forth, it is certainly of



ERMINE-WEASELS.

more frequent occurrence than that species; and for one weasel I have seen at least five or six ermines. It frequents stony places and thickets, among which it finds a secure retreat, as its agility enables it to outstrip even a dog in a short race, and the slimness of its body allows it to enter a very small aperture. Patches of furze, in particular, afford it perfect security, and it sometimes takes possession of a rabbit's burrow. It preys on game and other birds, from the grouse and ptarmigan downward, sometimes attacks poultry or sucks their eggs, and is a determined enemy to rats and moles. Young rabbits and hares frequently become victims to its rapacity, and even full-grown individuals are sometimes destroyed by it. Although in general it does not appear to hunt by scent, yet it has been seen to trace its prey like a dog, following its track with certainty. Its motions are elegant, and its appearance extremely animated. It moves by leaping or bounding, and is capable of running with great speed, although it seldom trusts itself beyond the immediate vicinity of cover. Under the excitement of pursuit, however, its courage is surprising, for it will attack, seize by the throat, and cling to a grouse, hare, or other animal strong enough to carry it off, and it does not hesitate, on occasion, to betake itself to the water. Sometimes, when met with in a thicket or stony place, it will stand and gaze upon the intruder, as if conscious of security; and, although its boldness has been exaggerated in the popular stories which have made their way into books of natural history, it cannot be denied that, in proportion to its size, it is at least as courageous as the tiger or the lion."

Mr. Bell was informed by the Rev. F. W. Hope that the latter, while shooting in Shropshire, was attracted by the loud shrill scream of a hare which he thought had been just caught in a poacher's snare. He ran toward the spot, and there saw a hare limping off, apparently in great distress, with something attached to the side of the throat. This proved to be a stoat, and the stricken hare made its way into the brushwood with its enemy still holding on. In England it takes advantage of the galleries of the mole for its winter retreat, as well as the rabbit-burrow.

Captain Lyon, in the polar regions of America, saw the ermine hunting the footsteps of mice as a hound would hunt a fox, and observed their burrows in the snow, which were pushed up in

the same manner as the tracks of moles in Britain. These passages ran in a serpentine direction, and near the hole or dwelling-place the circles were multiplied, as if to render the approach more intricate.

The same graphic voyager gives a lively description of a captive ermine: "He was a fierce little fellow, and the instant he obtained daylight in his new dwelling, he flew at the bars, and shook them with the greatest fury, uttering a very shrill, passionate cry, and emitting the strong, musky smell which I formerly noticed. No threats or teasing could induce him to retire to the sleeping-place, and whenever he did so of his own accord, the slightest rubbing on the bars was sufficient to bring him out to the attack of his tormentors. He soon took food from the hand, but not until he had first used every exertion to reach and bite the fingers which conveyed it. This boldness gave me great hopes of being able to keep my little captive alive through the winter, but he was killed by an accident."

Sir John Richardson states that the ermine is a bold animal, and often domesticates itself in the habitations of the American fur-traders, where it may be heard the live-long night pursuing the white-footed mouse. He remarks that, according to Indian report, this species brings forth ten or twelve young at a time. In this country it produces about five in April or May.

In Siberia, ermines are taken in traps baited with flesh; and in Norway they are either shot with blunt arrows, or taken in traps made of two flat stones, one being propped up with a stick, to which is fastened a baited string. This the animal nibbles, when the stone falls and crushes it. Two logs of wood are used for the same purpose, and in the same manner, in Lapland.

In the United States the ermine usually passes for a weasel, its habits being the same as those of the ermine of Europe. In the same manner it pursues the rabbit and hare, and in the same manner invades the poultry-yard. A single ermine has been known to kill forty full-grown fowls in a single night. Its destruction of mice is enormous, and probably it is rather a benefactor to the farmers, despite its depredations. Though nocturnal in its habits, it is seen at all hours of the day. It does not dig its own burrows, but makes its nest in heaps of stones, in hollows beneath the roots of trees, or in the vacated burrows of the ground-squirrel. It is nowhere common, but is occasionally seen over nearly the whole of North America.

The Common Weasel of Europe, *P. vulgaris;* the *Belette* of the French, *Donnola*, *Ballotula*, and *Benula* of the Italians, and *Wisel* of the Germans, is one of the most remarkable of known animals. "The stoat," says Mr. Bell, "is brown above, dirty white beneath; the tail always black at the tip, longer and more bushy than that of the weasel, and the former animal is twice as large as its elegant little congener. The weasel, on the other hand, is red above, pure white beneath, the tail red and uniform. Their habits also, though generally similar, are in many of their details considerably distinct; and we are fully borne out by observation in saying that the accusations against the weasel of the mischief which he is said to perpetrate in the farm-yard and the hen-roost, as well as among game of every description—on hares and rabbits no less than on the feathered tribes—are principally due to the stoat. It is not meant to be asserted that the weasel will not, when driven by hunger, boldly attack the stock of the poultry-yard, or occasionally make free with a young rabbit, or a sleeping partridge; but that its usual prey is of a much more ignoble character is proved by daily observation. Mice of every description, the field and the water vole, rats, moles, and small birds, are their ordinary food; and from the report of unprejudiced observers, it would appear that this pretty animal ought rather to be fostered as a destroyer of vermin than extirpated as a noxious depredator. Above all, it should not be molested in barns, ricks, or granaries, in which situations it is of great service in destroying the colonies of mice which infest them. Those only who have witnessed the multitudinous numbers in which these little pests are found, in wheat-ricks especially, and have seen the manner in which the interior is sometimes drilled, as it were, in every direction by their runs, can at all appreciate the amount of their depredations; and surely the occasional abduction of a chicken or a duckling, supposing it to be even much more frequently chargeable against the weasel than it really is, would be but a trifling set-off against the benefit produced by the destruction of those swarms of little thieves."

Mr. Bell adds, as ground for this defense of the weasel, that a friend of his assured him that at

least three bushels of different species of mice had been killed out of one wheat-rick, a number that will not surprise those who have seen a good thoroughly routing mouse-hunt in a grain rick-yard or granary, where the mice have taken up their quarters in earnest. Great good the weasel certainly does, and its usual mode of attack, when it reaches its prey, shows that small quadrupeds and birds form its staple food. It inflicts a bite on the head, which pierces the brain, and seldom fails to lay the victim dead at its feet by a single stroke. But there can be no doubt that it is a destroyer of newly hatched gallinaceous and grown birds and young ducks, as well as the smaller feathered tribes, and that although it does good service in keeping down the mice, it is a bad neighbor to the hare and rabbit warrens. Not that a weasel will do one third the mischief that a stoat will, nor upon animals of such large growth; but it will do enough. It is a most active and persevering hunter; few trees will stop it when in search of bird's nests, which it robs not only by sucking the eggs, but by carrying off the young. It will hunt the mole, the field-mouse, and other small quadrupeds in their usual haunts, not only by the eye, but by scent, like a stoat, and most amusing it is to see one of these flexible, agile little creatures tracing up the scent when it is at fault. They will quarter the ground like a dog till they hit it off, and to lose no help from the eye, will occasionally sit up, raising themselves on their hind-quarters to gain a more extended view around them. Their perseverance will tire down animals larger and stronger than themselves, nor will water stop them when their prey takes to it for safety. In they plunge, and seldom quit their object till the fatal bite is inflicted. The brain is generally first eaten, and the body of the victim kept as a supply near the haunt of the little hunter; but it seems very questionable whether they are addicted to the blood-sucking propensities which the vulgar attribute to them. The probability is that this charge has been greatly exaggerated.

The last-named acute zoologist throws well-grounded doubt on the assertion that the weasel will attack and destroy snakes; and, indeed, he believes such a notion to be entirely erroneous. He placed a weasel and a common snake together in a large cage, in which the former had the opportunity of retiring into a small box in which it slept. Mutual fear was manifest, and the animal kept at a distance; the snake, however, showing as much disposition to be the assailant as the weasel, which at last gave the snake an occasional slight bite on the side or on the nose, without, however, materially injuring the reptile, and evidently without any instinctive desire to feed upon it. After they had remained two or three hours together, the animals appeared almost indifferent to the presence of each other. The snake was then removed.

"How different was this weasel's conduct," says Bell, after relating the experiment above stated, "when a mouse was introduced into the cage! It instantly issued from its little box, and in a moment one single bite on the head pierced the brain, and laid the mouse dead without a struggle or a cry. I have observed that when a weasel seizes a small animal, at the instant that the fatal bite is inflicted, it throws its long, lithe body over its prey, so as to secure it should the first bite fail; an accident, however, which I have never observed to occur when a mouse has been the victim. The power which the weasel has of bending the head at right angles with the long and flexible, though powerful neck, gives it great advantage in this mode of seizing and killing its smaller prey."

This destroyer becomes itself a victim to birds of prey. We have all heard the story of the eagle and cat, and how the maddened quarry brought the mighty bird that had snatched it away down again to the earth in the agonies of death. In the "Magazine of Natural History" a similar anecdote is recorded of a stoat and an eagle, not, however, with any strong voucher. But Mr. Bell, on the authority of Mr. Pindar, residing, when the event occurred, at Bloxworth, in Dorsetshire, relates the following passage in the life of a weasel, and as there is no ground whatever for doubt, it affords a striking instance of the murderous instinct of this little quadruped.

Mr. Pindar, while riding over his grounds, saw at a short distance from him a kite pounce on some object on the ground, and rise with it in his talons. "In a few moments, however, the kite began to show signs of great uneasiness, rising rapidly in the air, or as quickly falling, and wheeling irregularly round, while it was evidently endeavoring to force some obnoxious thing from it with its feet. After a sharp but short contest, the kite fell suddenly to the earth, not far from where Mr. Pindar was intently watching the manœuvre. He instantly rode up to the spot, when

a weasel ran away from the kite, apparently unhurt, leaving the bird dead, with a hole eaten through the skin under the wing, and the large blood-vessels of the part torn through."

With similar courage the weasel will attack dogs, and even men, when its nest is invaded. This is formed of dry leaves and herbage, and is generally lodged in some snug locality, such as a crevice in a bank, the hollow of a tree, or a dry ditch, which keeps it warm and comfortable. Here four or five young are brought up from each birth, the number of these litters being two, and even three, in the year.

This species sometimes, but rarely, turns white in the winter; in this state it is the *Mustela nivalis* of Linnæus. Mr. Bell received one from Scotland with two white spots on each side of the nose, which it retained throughout the summer.

In America, we have several different kinds of weasel, and one of them has been regarded as identical with the preceding; but this opinion seems not to be well founded.

The *Putorius Boccamela* is a species of weasel nearly of the size of the ermine, found in Italy and Algeria. In Asia there are the *P. Hodgsonii*, *P. Horsfieldii*, and *P. Cathia.*



MINKS.

The Mink, *Vison* of Buffon, *Mustela Vison* of Linnæus, *Minx Otter* and *Vison Weasel* of Pennant, the *Jackash* of Hearne, the *Putorius Vison* of De Kay, has the long, slender body of the genus; the color, varying in different species, is generally dark brown, with a light spot under the throat. When seen in the woods or fields the animal appears black, and hence "black as a mink" is a proverbial expression among us. There is considerable difference in the size; thirteen inches is, however, the average length of the body and head. The mink has not only the form of the weasels, but much of their activity and voracity. They frequently take up their abode near the poultry-yard, where they make great havoc. They frequent the streams, where they swim well, and prove themselves to be expert fishermen. They not only eat fish, but frogs and crawfish, besides mice and rats, the latter furnishing a good part of their living. They have a good nose, and follow their prey by scent with the certainty of a hound. They are fond of water, preferring small streams; they delight in rapids and waterfalls, and often make their residence at their feet. Many of them frequent the marshes of the Southern States, where they feed on small shell-fish and aquatic insects, with such shore birds as they can seize. The marsh-hen frequently becomes their prey. They sometimes ascend trees, but not often; they are neither suspicious nor cunning, and are easily caught in traps. The young are produced in April, and from four to six at a time. The fur was once much esteemed, but it is now of little value; some specimens, however, of peculiar fineness, and of a beautiful silver-gray, still bring large prices. This animal is peculiar to North America, and is distributed throughout nearly its whole extent, being rare, however, in the more settled parts.

The Mountain Brook Mink, *P. nigrescens*, is somewhat smaller than the preceding, the body being about eleven inches long. In color and habits it resembles the vison. It is found in the mountainous regions from Canada to Pennsylvania.

The European Mink, *N. lutreola*, is a weasel of the north of Europe, somewhat smaller, and of a darker color, than the *Vison;* its habits are, however, similar, and many naturalists have regarded the two as of the same species.

The Little Nimble Weasel, *Putorius agilis*, is a small American species, light brown in summer and white in winter; the body is five inches long. It is found in the State of New York, but its habits are not much known.

The Brown or Tawny Weasel, *Putorius fuscus*, is found in the State of New-York, and probably exists in some of the Western States. Its body and head are nine inches long; it is therefore two inches longer than the common weasel of Europe. Its color, which does not change in winter, is a uniform tawny brown on the upper parts, and white beneath.

The Brindled Weasel, *Putorius frenatus*, is of the size of the ermine; its color is yellowish-brown above, and white beneath. It is found in Texas, California, and Mexico.

The Small Weasel, *Putorius pusillus*, is also an American species, and one of the smallest, being only seven inches long. It feeds on insects, mice, and birds' eggs. Its color is a light yellowish-brown above, and white beneath. It is found in the fur countries of the north, and as far south as the State of New York. The skin becomes white in winter far to the north, but not in the more southern portions of its range. Richardson believed this to be the same as the common weasel of Europe, but he was doubtless mistaken.

There are still some other American species of weasel, but their characteristics are very imperfectly known.



THE ZORILLA.

Genus ZORILLE: *Zorilla*.—Of this genus there is but a single species, found at the Cape of Good Hope and Senegal, and variously denominated by different authors, as *Zorilla striata*, *Z. variegata*, *Z. Capensis*, *Z. Viverra*, &c. It has been included in the same genus as the skunks of America, and indeed the *Nyenteck* or *Helictis* of Asia, and the *Mydaus* of Java and Sumatra, all analogous to the weasels, and all diffusing a fetid odor, have been sometimes included in the same group. As we have placed these according to structure and appearance in separate genera, so we now give a distinct place to the zorilla. This animal is about the size of a polecat, and resembles it in form and habits. Its general color is black, spotted on the head, and striped on the back with white. By some it is called the *Cape Polecat*. This, in fact, is its proper designation. The term *Zorilla* means *Little Fox*, and was first given to the moufettes of South America on account of their intolerable odor. To them it properly belongs, but Buffon used it

in application to the African animal, and it has since been applied by other writers in the same way. One of the American skunks retains it as its popular designation.

Genus LYNCODON: *Lyncodon* of Gervais.—Of this there is a single species, found in Patagonia. It is between the polecat and ermine in size; its appearance and habits are but partially known.

LUTRINS, OR OTTERS.

Of this tribe, there are several genera and numerous species, all possessing the general form of the mustelidæ, with aquatic habits, and living on fish. The teeth are sharp and strong, the tubercles of the molars being very pointed, a modification necessary to enable them to secure their agile and slippery prey.



OTTERS.

Genus OTTER: *Lutra*.—Of this there are several species. The Common Otter of Europe, *L. vulgaris*, is the *Loutre* of the French, *Lodra*, *Lodia*, and *Lontra* of the Italians, *Otter* and *Fisch Otter* of the Germans, *Nutria* and *Lutra* of the Spanish. The head and nose are broad and flat; neck thick; body elongated; tail broad at the base, compressed horizontally, and tapering to a point; the eyes, which are not large, are placed comparatively near to the nose; the ears are very short, and the auditory opening rather narrow; the mouth is small, and the lips are capable of being firmly closed together; the whiskers are very long; the legs very short, strong, stout, and muscular; the five-toed feet are furnished with strong, broad webs, like those of waterfowl which have these accessories best developed. Hence Somerville terms the otter "goose-footed." The color is brown, deepest on the upper parts, with the exception of two small patches of white on the lips, one on each side of the nose. This species varies in size, being from two feet two inches to forty-two inches in length, including the tail, which is one fourth that of the body. The usual weight of a male is from twenty to twenty-four pounds, though Pennant speaks of one weighing forty pounds.

The natural food of the common otter is fish, for the chase and capture of which its whole frame is beautifully adapted. How silently is the water entered! The eyes are so placed, that whether the animal is swimming below its prey, behind it, above it, or on either side of it, the least motion of the head and neck, brings it within the sphere of the pursuer's vision. The whole frame-work of the animal, its short fin-like legs, oary feet, and rudder of a tail, enable

it to make the swiftest turns, nay, almost bounds in the water, according as the rapidity of its agile prey demands a sudden downward dive, an upward spring, or a side snap. The short fur, which is close and fine, keeps the body at a proper temperature, and the longer and outer hairs directed backwards, enable it to glide through the water, when propelled horizontally by its webbed feet beneath the surface, noiselessly and speedily. Easy and elegant in its motions, there are few objects more attractive in menageries than the pond, especially if it be kept clean and supplied with clear water, wherein the otter is seen to hunt its living prey. When it has seized a small fish, it instantly leaves the water and devours it, beginning with the head, while the body is held between the fore-paws Larger fish are held down by the paws, and the head and tail are often left uneaten. The havoc made by these animals in the rivers and ponds is great; for they will go on killing, and eat but a small portion of each fish, if it be large, when they find plenty of prey. When fish is scarce, and it is pressed by hunger, the otter has been known to resort far inland, to the neighborhood of the farm-yard, and attack lambs, sucking-pigs, poultry, and young domestic animals; the stomach of one, killed in June, has also been found, filled with a curious collection of larvæ and earth-worms. The period of gestation is said to be nine weeks, and the number of young produced varies from three to five. The otter's places of refuge near rivers and lakes are beneath the roots of trees or in holes.

This animal is found generally throughout Europe. Though chiefly living amid rivers, lakes and ponds, it is not confined to the fresh waters. They are known to frequent the sea in the north of Scotland, and to hunt far out in the water. In the south of England—Cornwall—the otter will go a mile from the shore, in the summer and good weather, after its prey. On the sea-shore, rocky caves with scattered blocks, hollows, and cavities under large stones, are its haunts.

The otter is capable of domestication and attachment. Goldsmith mentions one which went into a gentleman's pond at the word of command, drove the fish up into a corner, and having seized on the largest, brought it out of the water to its master. Daniel, Bewick, Shaw, Bell, and Macgillivray furnish corroborating facts. The latter has collected the following anecdotes: "Mr. M'Diarmid, in his amusing 'Sketches from Nature,' gives an account of several domesticated otters, one of which, belonging to a poor widow, when led forth plunged into the Uur, or the neighboring burns, and brought out all the fish it could find. Another, kept at Corsbie House, Wigtonshire, evinced a great fondness for gooseberries, fondled about her keeper's feet like a pup or kitten, and even seemed inclined to salute her cheek, when permitted to carry her freedoms so far. A third, belonging to Mr. Monteith, of Carstairs, was also very tame, and though he frequently stole away at night to fish by the pale light of the moon, and associate with his kindred by the river side, his master, of course, was too generous to find any fault with his peculiar mode of spending his evening hours. In the morning he was always at his post in the kennel, and no animal understood better the secret of keeping his own side of the house. Indeed, his pugnacity in this respect gave him a great lift in the favor of the game-keeper, who talked of his feats wherever he went, and avowed, besides, that if the best cur that ever ran 'only dared to grin' at his protegé he would soon 'mak his teeth meet through him.' To mankind, however, he was much more civil, and allowed himself to be gently lifted by the tail, though he objected to any interference with his snout, which is probably with him the seat of honor." They are, however, dangerous pets; for, if offended, they will bite grievously.

As an article of food, the flesh being fishy, the otter was not forbidden by the Roman Catholics. Their church permitted it to be eaten on maigre days, and Pennant saw one in the kitchen of the Carthusians, near Dijon, under preparation for the dinner of the religious of that rigid order, who, by their rules, are prohibited during their whole lives, from eating flesh. Mr. Macgillivray states that he knew a man in the island of Harris who procured a considerable number every year, when the skins were more in request than now, and who generally cooked the flesh, of which Mr. Macgillivray once partook with the family. It was "dark-colored, rank, sapid enough, but not agreeably so;" and under the skin was a layer of fat, as in the seals, which might, he adds, "render it pleasant food to a Greenlander or starving Hebridian."

The Irish Otter has been elevated to the rank of a species by Mr. Ogilby, under the name of *L. Roensis*, on account of the intensity of its coloring, which approaches nearly to black both on

the upper and under surface; it has also less extent of the pale color beneath the throat, as compared with the *L. vulgaris;* and there is some difference in the ears, and in the proportions of other parts. Other naturalists regard this only as a variety. The kind spotted with white, is called "King of the Otters" by the ignorant Scotch, who hold that it bears a sort of charmed life, in so far that its death is never unaccompanied by the death of a man or some other living creature. The skin is considered precious as an antidote against infection, wounds, and the dangers of the sea. One of these spotted otters is at the Museum at Paris, near which place it was found. Mr. Macgillivray says that he has heard of white otters, but had never seen an albino.

In the older annals of sporting in England, otter-hunting holds no inconsiderable place. Somerville describes it at some length, and with much unction. It is now fast dying away, but is still kept up in some parts of Wales and Scotland.

The Nair-Nair, *L. Nair*, has the fur deep-chestnut, lightest on the sides; the lower part of the neck and cheeks, as well as the throat, bright reddish-brown; above the eye a ruddy yellow or yellowish-white spot. It is the *Nir-nayie* of the people of Pondicherry, the *Water-cat* or *Juhl Marjur* of the Mahrattas, and is probably the species seen by Bishop Heber, who passed a row of nine or ten large and very beautiful otters, tethered with straw collars and long strings to bamboo stakes on the banks of the Matta Colly. "Some," he says, "were swimming about at the full extent of their strings, or lying half in and half out of the water; others were rolling themselves in the sun on the sandy bank, uttering a shrill whistling noise, as if in play. I was told that



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most of the fishermen in this neighborhood kept one or more of these animals, who were almost as tame as dogs, and of great use in fishing; sometimes driving the shoals into the nets, sometimes bringing out the larger fish with their teeth." This is another proof, if any were wanting, of the feasibility of taming these animals and rendering them useful to man. The nair-nair is a native of the East Indies.

The American Otter, or Canada Otter, *L. Canadensis*, is the *Loutre de Canada* of Buffon; *Lutra Brasiliensis* of Harlan; *Neekeek* of the Cree Indians; and *Capucca* of the inhabitants of Nootka. This animal, peculiar to America, has the fur above and below shining brown, and much resembling that of the beaver. The size is much larger than that of the European otter, measuring from the nose to the tip of the tail, which is eighteen inches, five feet. In

its habits and food it resembles the European species. In the winter season it frequents rapids and falls for the advantage of open water, and when its usual haunts are frozen over it will travel to a great distance through the snow in search of a rapid that has resisted the frost. When seen and pursued by the hunters, as it is on these journeys, it throws itself forward on its belly, and slides through the snow for several yards, leaving a deep furrow behind it. This movement is repeated with so much rapidity, that even a swift runner on snow-shoes has much trouble in overtaking it. It also doubles on its track with much cunning, and dives under the snow to elude its pursuers. When closely pressed it will turn and defend itself obstinately. When Sir John Richardson's party were at Great Bear Lake, in the spring of 1826, these otters robbed their nets which had been set under the ice a few yards from a piece of open water. They generally carried off the heads of the fish, leaving the bodies sticking in the net. The female brings forth one litter in the year, consisting of two or three.

This otter is found throughout Canada and the United States, even as far south as Brazil, but it is most abundant on the Mackenzie and other rivers near to the Arctic Sea. There appears to be no difference between the skins obtained on the shores of the Pacific and those in the neighborhood of Hudson's Bay. The fur is valuable, and is a considerable article of commerce; it varies with the season. In summer the hair is very short, and then it is almost black; in winter it becomes a rich reddish-brown, with the exception of the grayish spot under the chin. The fur is nearly as fine as beaver-wool, but not so long, and consequently is not so well adapted for felt. The nest in which these animals spend a good portion of the day, is sometimes made in a bank of earth, and sometimes in the trunk of a fallen tree; it is lined with sticks, grasses, and leaves, and is of large size, and well protected from the rains, being, at the same time, beyond the reach of rising floods. They have a habit of sliding off wet sloping banks into the water, which is taken advantage of by the trappers to catch them, by placing sunken steel-traps in places where these animals are thus accustomed to amuse themselves. Godman tells us that they are fond of sliding down hill, in winter, upon the snow banks, going on their bellies, feet first, in the manner of a parcel of school-boys "coasting," as it is called in New England. They are said to enter into the sport with great spirit, and to pursue it with intense eagerness and delight.

These animals are easily tamed when taken young; they are very playful, and will follow their keeper from place to place; they will become familiar, crouching in the lap like a cat. In confinement, they eat milk and bread; in a wild state they prefer fish, but sometimes feed on birds and other game.

Specimens of this kind of otter have been described as distinct species by several authors: instances are the *L. Brasiliensis* of Ray, and the *L. Californica*, as well as the *Lataxina mollis* of Gray. It may be remarked, that there is considerable variety in the sizes of these animals and the shades of their color; the fur of those taken at the north is also uniformly finer and closer than those taken at the south.

The Brazilian Otter, *L. Brasiliensis*, which we regard as of the same genus as the preceding, is called *Lobo de Rio*, or *River-wolf*, by the natives. D'Azara says that it lives in troops, which, sometimes rising to the surface of the water, lift their heads and bark like dogs, with a hoarse voice, in a menacing and snapping manner, without, however, injuring voyagers or swimmers. Each family seems to possess a separate domain. It spends nearly as much time in the water as it does upon land, where it devours the fish which it has taken, and rears its young in holes which it excavates in the banks. The same author was informed by the Payaguas Indians, who sail continually up and down the river, and are better acquainted with this animal than others, that the female brings forth two at a birth, covered with hair, and that many females bring forth and rear their young at the same time, and in the same place, their usual resort throughout the year. The motions of this otter are generally slow, and it drags, as it were, its belly and muzzle along the ground; when it runs it is not at all swift.

D'Azara further states that a neighbor of his purchased a young whelp, which, at six months old, was thirty-four inches long. It was permitted to run loose about the house, and was fed with fish, flesh, bread, mandioca, and other food, but it preferred fish. It would walk into the the street and return, knew the people of the house, came when called by name, and would fol-

low them like a dog, but its short legs soon failed it, and it grew weary. It would amuse itself with dogs and cats as well as with their masters; but it was a rough play-fellow, and required to be treated cautiously, for it bit sharply. It never harmed poultry, or any other animal, excepting sucking-pigs, which were not safe within its reach, and it would have killed them if it had not been prevented. It entered all the rooms, and slept always below the bed; was very cleanly, and always visited one particular spot for the deposit of its excrements.

According to D'Azara, this species inhabits the lakes and rivers of Paraguay; he at first stated that he did not believe that it entered salt-water, and that its geographical range did not extend to the river Plata; but in his French abridgment he says that the species is found in that river.

Genus LATAXIE.—Under this title, some naturalists enumerate several other species of otter, as the Carolina Otter, *L. lataxina;* the Trinity Otter, *L. insularis;* the Chilian Otter, *L. Chilensis;* the Peruvian Otter, *L. Peruviensis;* the La Plata Otter, *L. Platensis;* the Paraguay Otter, *L. Paræensis*, &c.

Other species of otter are ranged under the generic titles of Leptonix, Aonyx, Saricovienne, and Pteronure. These distinctions of nomenclature are founded upon slight peculiarities of structure, the general characteristics of all the species being similar to those we have described.

Genus ENHYDRA, SEA-OTTER, or SEA-BEAVER: *Enhydris.—Mustela lutris* of Linnæus; *Mustela marina* of various authors; *Loutre de Kamtschatka* of the French. This animal, of which there is but one species, haunts sea-washed rocks around bays and estuaries, lives mostly in the water, and approximates to the seals more than to the otters in its habits. Its food is lobsters and fish of various kinds. The female brings forth on land, and notwithstanding the general marine instincts of the animal, it has been occasionally seen far inland. It is very timid, and prefers the neighborhood of islands, where it can at once find food and shelter. It is found in the North Pacific, from Kamtschatka to the Yellow Sea on the Asiatic side, and from Alaska to California on the American coast.

The sea-otter has a small head, large body, short legs, short tail, webbed feet, fur thick, fine and glossy, and generally of a brownish black, though the species vary in the depth of tint. The length of the head and body is four feet and upwards; tail, one foot. The skins are valuable, though less so than formerly; they are chiefly consumed in China, where they are worn as badges of distinction by the high functionaries. Gervais says,—"According to their degree of perfection, and the fineness and luster of the fur, their skins at the present day are valued at 800 to 1,500 francs. It appears that they decrease year by year, and the price tends to constant augmentation. In the time of Steller, a company of sailors would take eight hundred of these creatures during an expedition. At the present time, a party of seal-catchers, who are also otter-hunters, often do not take a single one. On the coast of Japan they are now only seen occasionally."

Fossil Mustelidæ.—The fossil remains of weasels have been found in the tertiary series in the bone-caves and bone-breccias at various places in Europe.



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WALRUSES.

ORDER 6. **PINNIPEDIA.**

The order of the *Pinnipedia*, or *Seals* and *Walruses*, is distinguished from all other mammalia by the peculiar structure and arrangement of the limbs. The toes of all the feet are united almost to their extremities by the common integument, by which they are converted into broad fin-like organs, the bones of the arm and leg being usually short, and concealed, to a great extent, beneath the skin of the body. The tips of the toes are armed with strong claws, and these are frequently almost the only indication of their existence, although the bones are the same as those of the most perfectly organized mammalia. The position of the hind-feet is very remarkable; they are placed quite at the hinder extremity of the body, and thrown backwards into a nearly horizontal position on each side of the very short tail, so as to resemble the horizontal tail of the whale, and, like this, they constitute the principal agents in the locomotion of the animals in their natural element, the water, where they swim and dive with the greatest facility. When swimming, the fore-paws are applied close to the side of the body, and are only used in turning about.

The general form of the body is particularly adapted for a residence in the water, being nearly cylindrical, and tapering gradually from before backward; the neck is short, and the head small and rounded. Like the cetacea, which they resemble in their general form, the seals have the surface of the body covered with a stratum of blubber, which serves the same purpose as in those mammalia. The skin, however, is covered with hair of two kinds—a soft woolly down, close to the skin, and a coat of long, smooth hairs, which lie close to the body, and form a shining coat, offering no resistance to their passage through the water.

The skull and jaws are compact and powerful, and the former exhibits strong ridges for the attachment of the muscles of the jaws. The orbits are usually continuous with the temporal fossæ. The teeth are always of three sorts, but they vary considerably in number. The incisors are usually small, but the canines are large and powerful, curved and sharp at the point, indicating the carnivorous nature of the animals. A further evidence of this is furnished by the form of the molar teeth, which are remarkable for being usually furnished with only a single root; their

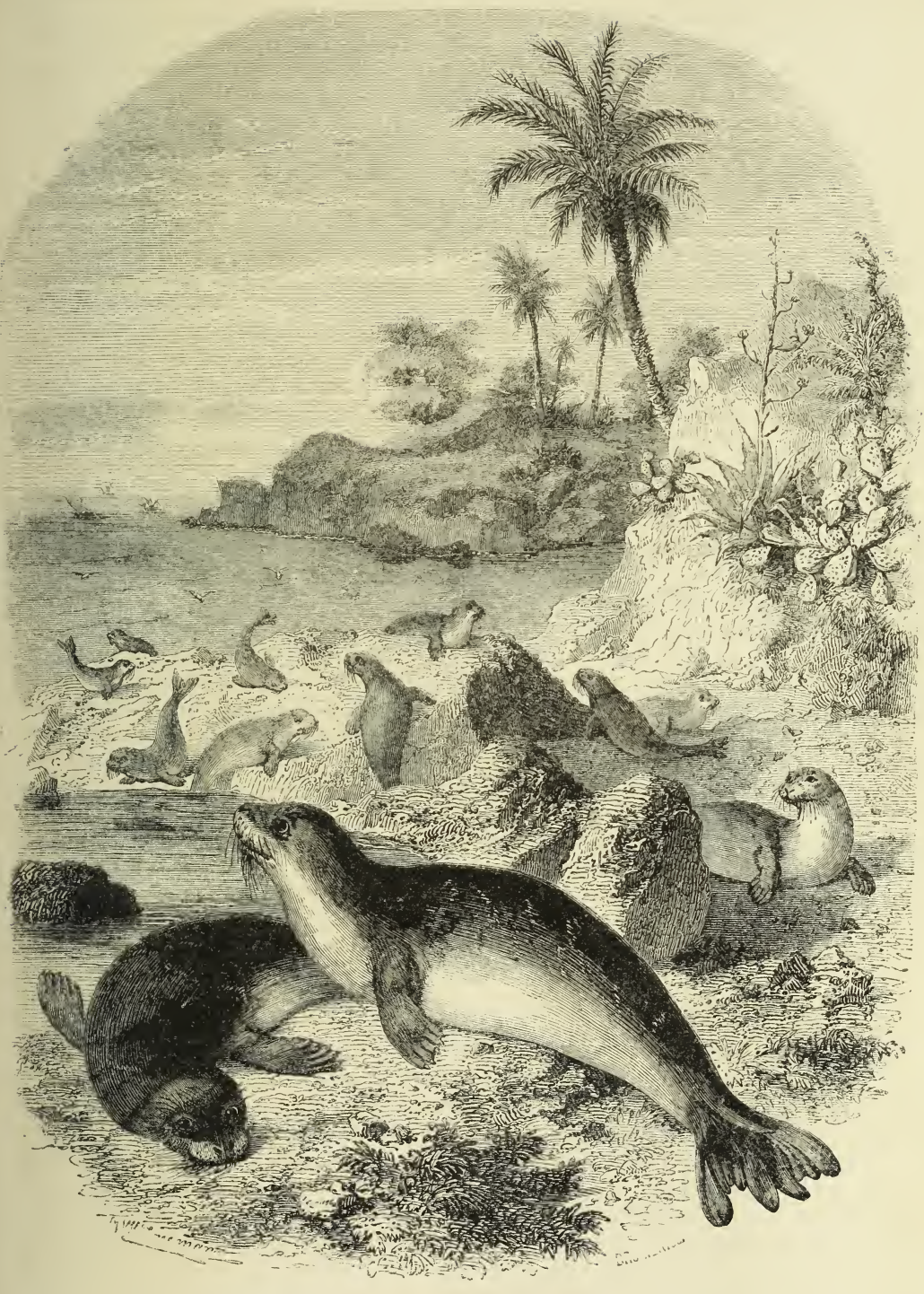
crowns are strongly compressed laterally, with sharp cutting edges, which are usually more or less notched, and sometimes deeply cleft, so as to form three or more distinct points.

The mouth is furnished with thick, fleshy lips, from which spring numerous long bristles. The tongue is smooth. The nostrils are placed at the front of the snout, and are capable of being completely closed when the animal is under water. The external ears are usually represented by a small valve, which closes the aperture under the same circumstances. The eye is large, full, and expressive of intelligence, a quality which is exhibited by these animals in a very high degree; and the brain, as might be expected from this circumstance, is of large size, and of a very high type of organization. The mammæ are usually only two in number, and placed far back; the female produces a single young one, and attends to it with great assiduity. The voice of the seal is usually a kind of bark, whence the name of *Sea-dogs* is applied to them in some countries. Though the genera are not numerous, there are great multitudes of these creatures, certain seas and coasts swarming with them by thousands.

The habits of all the animals of this order are very similar. They live in the sea, but always in the neighborhood of the coasts, where they wage an incessant war upon the fishes, which constitute the principal food of all, with the exception of the walrus. They are not, however, like the cetacea, entirely confined to the water, but can easily climb upon the low rocks, where they are fond of lying in herds basking in the sun. Thus living a part of the time in the water and a part on the land, they are what are called *amphibious*. When on shore they are exceedingly watchful, and appear to have sentinels to give notice of the approach of an enemy, and plunge into the water the moment any danger approaches them. On land, as might be expected from the structure of their feet, their movements are very awkward; they are performed by the action of the strong muscles of the back; the creatures hold by their fore-paws, while they curve the back strongly, and thus draw forward the hind-feet; the latter then form the point of support, and the head and fore-paws are pushed on by the straightening of the body. This mode of progression is evidently very laborious, and the seals never travel to any great distance on the land.

The Phocidæ, or True Seals, exhibit the typical characters above described in the greatest perfection. They are distinguished from the walrus family by the possession of incisor teeth in both jaws, and by the moderate size of the canines. The molars are sharp-edged, and either simple or notched; in the latter case they are usually furnished with two roots. An external ear is present only in one genus, the *Otaria*, the species of which inhabit the Southern Ocean. Nevertheless, they hear well when under water, and are easily attracted to the surface by a noise. They are often seen in such shoals in the northern seas as to appear like a continuous mass, and therefore are supposed to have given rise to the story of the *Kraken*. For the sake of respiration, they will appear now and then on the surface, springing up with their heads and necks, and often their whole bodies out of water. When a shoal of them comes thus to the surface, the sailors call it a *Seal's Wedding*. They feed on fishes, crabs, and aquatic birds. They swim with great rapidity, and, before a gale of wind, are full of frolic, jumping and tumbling about, sometimes throwing themselves entirely out of the water, and performing many awkward gambols, at last retiring to their wonted rocks or caverns, and there remaining till the storm is over. They seem to have much curiosity: if people are passing in boats they often come up very close, stare at them, and follow them a considerable time. If the people are speaking loud, they seem to pay much attention, and to exhibit some surprise. We are told that when a church bell rings for divine service on the coast of the Orkneys, all the seals within hearing swim directly for the shore, and remain while the bell continues ringing, looking about with much appearance of wonder, but without alarm. They are for the most part confined to the seas of the extreme northern and southern parts of the world, abounding especially around those coasts which approach most closely to the two poles. Some of the northern species are, however, occasionally seen as far south as the coasts of France, on the eastern side of the Atlantic, and as far as Long Island on the western side. They embrace several genera.

In regard to the seals, Gosse makes the following interesting observations: "It is necessary that they—the mammalia generally—be thus constantly bathed in air; for an interruption of the process of respiration, for only a few seconds, would cause instant death. But the tribe before us



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is, in its habits and motions, essentially aquatic, and though its respiration is still exclusively ærial, yet it is suspended for long intervals, usually a quarter of an hour; and sometimes, as in a case witnessed by F. Cuvier, extending to an hour. Notwithstanding this peculiarity, the blood is abundant and very hot; it is, however, also very black. Intended to pursue the fishes that glide so swiftly through the depths of ocean, these amphibia are perfectly formed for this object; and while we find in them all the organs common to terrestrial animals, it is highly interesting to behold how beautifully and skillfully each is modified in form to correspond to the required change of habit. None can look upon a seal without being at once struck with its fish-like shape; the rounded chest tapering away to a point, which is the most favorable form for rapid progression in water. To counteract the chilling influence of the medium in which they dwell, the whole body is encased in a thick layer of highly elastic fat, which also resists the pressure of the superincumbent water at great depths, and renders the whole animal specifically lighter,—three very important purposes. The skin is clothed with thick, downy wool; but as this would impede swift motion, it is covered with an outer coat of close, strong, shining hair. The nostrils are closed at will; the orifice of the ear can also be closed; and the eye is furnished with a third eyelid, which can be drawn across it as a defense. The limbs are short, and almost inclosed within the body, little more than the feet projecting; the toes, however, being strongly webbed, render them very efficient as fins; and the hind pair, in particular, from their shape and position, have a strong resemblance to the broad horizontal tail of the cetacea. In fact they answer the same purpose—that of sending up the animal rapidly to the surface, by a powerful, vertical stroke. The feet are scarcely used in motion on land, where yet they move with considerable speed. The mode in which this is effected, is another of the interesting peculiarities of this tribe. The vertebræ of the spine are much more separated than usual, the connecting cartilages being much larger, allowing it great freedom of curvature, and the muscles which bend it are particularly strong. In moving forward, the seal arches its spine, bringing the hinder part forward, then pressing with the hind feet on the ground, straightens the body with a jerk; and by a repetition of such apparently awkward springs as these, it manages to get along, sometimes at a good round pace."

Though little known to science, the seals have been long known to commerce; and the pursuit of the animals for their oil and skins forms no inconsiderable source of national wealth. Fleets of vessels of various sizes, manned by expert and hardy seamen, annually leave the shores of Europe and America, bound either for the Arctic regions, the coast of Newfoundland, or the desolate shores of extreme South America, whence they return, after long voyages attended with incredible hardships, loaded with the valuable products of the seal. The sealing trade of the South Sea is confined to the ships of England and the United States.

The following notes in regard to the Newfoundland seal-fishery, derived from the personal observations of Gosse, will be found interesting and instructive: "In the month of February, the sealing craft, usually schooners and brigs from sixty to one hundred and fifty tons, which had been laid up and partly dismantled all the winter, are prepared for the voyage, and by the first of March they are fitted out. The crew, according to the size of the vessel, varies from sixteen to thirty-five hands, many of whom are provided with large guns, and the rest with stout clubs or 'bats.' Each man has also a 'gaff,' or pole, provided with a hook at the end, to assist him in leaping from pan to pan when among loose ice. From the first to the tenth of March they endeavor to get out, but it frequently happens that the harbors are frozen over to the depth of several feet. In this case the crews of all the vessels in the port unite to cut with ice-saws a broad channel through the midst of the harbor to the open sea; and as these united crews sometimes amount to two thousand men, it may reasonably be supposed that the broad icy plain displays a scene of no ordinary animation and excitement. Each individual craft has to make good its own passage into the common channel; and when all the labors are completed, and the vessels, to the number of a hundred or more, are arranged in single file, and, with all canvas set and flags flying at every mast and peak, are rapidly sailing down the channel, before a steady breeze in the presence of all the assembled inhabitants, the sight is most exhilarating. One by one issues from the narrow gorge into the open water, and soon all are seen

scattered in the distance, and speckling the offing with their white sails, till they are gradually lost below the horizon. Each pursues its own course, according to the judgment of the master as to the position of the ice of which they are in search; those immense fields which, dislodged from the Arctic Regions in the preceding summer, have been through the winter pursuing a southerly direction. In some seasons, these fields keep close to the land, blockading the whole coast as they proceed, while in others they form a loose and unconnected belt, running down at the distance of two or three hundred miles from land.

"We will suppose, however, that a day or two's run has brought the vessel to the edge of the field, on which myriads of seals are discovered with their new-born young. The great majority are of one species, the Harp Seal—*P. Grœnlandica*—whose young, for the first two or three weeks, are covered with a dense coat of white wool, which drops off at the end of that period, and discovers the true fur, which is of a drab hue, variously spotted with black. The young in this earliest stage, when they are called *Whitecoats*, are exceedingly fat, and the oil they produce is more abundant and more valuable. In this state, of course, they are incapable of resistance, and are killed by a slight blow with the 'bat.' The gun is used only to shoot the old seals, in case the time of obtaining the *whitecoats* should have passed without success. Another species is also found, though not in so great numbers, the Hooded Seal—*P. cristata*—which, though of larger size, is less valuable. As soon as a seal is killed, and sometimes, we regret to say, even before, a circular cut is made with a sharp knife around the neck and a longitudinal one down the belly to the tail—the skin with the surface fat is 'scalped' off, forming altogether 'a pelt:' this alone is taken, the carcass being left upon the ice. The pelt of a young whitecoat has often three inches of fat, and weighs forty pounds. When three or four pelts are obtained they are laid one on another, and dragged by a rope, the fur side being undermost, to the vessel, when they are thrown into the hold and stowed.

"The whole adventure is full of hazard; in the excitement of the pursuit, leaps of terrific risk are taken from field to field, across yawning chasms, whose terrors are scarcely noticed; and sometimes night draws on, when the excited hunter, then first made aware of its approach, discovers that he is many miles from his vessel, with no clue to guide his return across interminable ice-fields. With the setting sun, the temperature has likewise rapidly gone down; and, perhaps, the bewildered voyager has to pass the night on unsheltered ice, in an atmosphere at zero. Frozen limbs are frequently the result of these exposures, and individuals in their attempts to return, often drop through holes, and are seen no more. But this is not all; for sometimes a sudden change of wind will separate fields of ice on which the men are sealing, and ere they are aware, they are driving far out to sea, helpless and hopeless.

"But we will suppose none of these accidents to have happened, but that the hold being filled with pelts, the vessel returns to her port: this sometimes happens in the course of ten days from departure, but sometimes it is delayed for several weeks. Arrived, the seals are landed at the wharf, where they were formerly received by tale; but of late years by weight, as the fairer mode. They are now to be skinned; for this purpose a man stands before the *skinning-table*, an inclined plane reaching from his middle to the ground. He seizes a pelt with his left hand, the fur being downward, then, with a sharp knife, edge outward, he boldly and dexterously cuts between the fat and the skin, the former rolling down in large and long masses, while the latter, though shaved clean, rarely receives a gash. A very expert hand will skin five hundred in a day. The fat as it is skinned is removed to a stage, where it is chopped into small portions, and then pushed into a vat beneath. Here it is allowed to remain, covered from the sun, until the advancing heat of spring melts the fat from the cellular tissue, which, when the oil has been drawn off, is rejected under the name of *scruncheons*.

"The skins, divested of fat, are salted in layers, in which state they are exported to England, to be used either as furs, or to be tanned into coarse leather. The value of pale seal-oil in the island may average £25 per ton, and salted skins £50 per thousand. A vessel of one hundred and twenty tons will bring in five thousand young seals, which, averaging 6*s.* 6*d.* each, produces £1,625. Half of this is divided equally among the crew, who, however, pay from 20*s.* to 30*s.* each for their berth; the other half belongs to the owner, who, if he be also master, receives

a man's share besides. A hired master has no share, but usually receives 4*d.* or 6*d.* per seal on the whole cargo. A few of the earliest discharged go out on a second trip, but this is rarely very productive, as, by the middle of May, all must be home to prepare for the cod-fishery."

The seal appears, from many authorities, to possess much intelligence, combined with docility, gentleness, and affection. F. Cuvier gives some touching details of the manners of a Marbled Seal—*P. discolor*—which was living in the menagerie of the Garden of Plants. He says: "Except in some monkeys, I have never known any wild animal which was more easily tamed, or attached itself more strongly. When it first came to us, it endeavored to escape when I wished to touch it; but in a very few days all its apprehensions vanished; it had discovered my intentions, and rather desired my caresses than feared them. It was in the same inclosure with two small dogs, which amused themselves by frequently mounting on its back, often barking, and even biting it; and, although these sports, and the vivacity of the attending movements, were little in harmony with its own actions and habits, yet it appreciated their motive, and seemed pleased with them. It never offered any other retaliation than slight blows with its paws, the object of which was to encourage rather than repress the liberties taken. If the puppies escaped from the inclosure, the seal endeavored to follow them. When the weather was cold, the three animals huddled closely and kindly together. It manifested no fear of man, nor attempted to avoid him, except to escape the being accidentally trodden upon. It would also suffer, without anger or resistance, the food which it was devouring to be forcibly taken away, even when hungry; and that not only by man, but also by his canine playfellows. On the other hand, when their mess was supplied to the seals—for he had a companion—as they lay in the same trough, a battle was the usual result, and blows with their paws followed, and, as usually happens, the more feeble and timid left the field to the stronger."

It is well known that the seal may be tamed, and in this state shows a remarkable degree of sagacity. It may be taught to perform various tricks, and also to go into the sea and catch fish for its proprietor. The following tale of a domesticated seal, mixed up with certain Irish superstitions, possesses a thrilling interest:

"About forty years ago, a young seal was taken in Clew Bay, and domesticated in the house of a man whose house was situated on the sea-shore. It grew apace, became familiar with the servants, and attached to the house and family; its habits were innocent and gentle; it played with the children, came at its master's call, and, as the old man described it, was fond as a dog, and playful as a kitten. Daily, the seal went out to fish, and, after providing for his own wants, frequently brought in a salmon or a turbot for his master. His delight in the summer was to bask in the sun, and in the winter to lie before the fire; or, if permitted, to creep into the large oven, which, at that time, formed the regular appendage of an Irish kitchen.

"For four years the seal had been thus domesticated, when, unfortunately, a disease, called in the country *the crippawn*—a kind of paralytic affection of the limbs, which generally ends fatally—attacked some black cattle belonging to the master of the house. Some died; others became infected, and the customary cure, produced by changing them to clover pasture, failed. A "Wise Woman" was consulted, and the hag assured the credulous owner that the mortality among his cows was occasioned by having an unclean beast about his habitation—the harmless and amusing seal. It must be made away with directly, or the crippawn would continue, and her charms would be unable to arrest the malady. The superstitious wretch consented to the hag's proposal; the seal was put on board a boat, carried out beyond Clare Island, and there committed to the deep to manage for himself as he best could.

"The boat returned; the family retired to rest, and the next morning, the servant awakened her master to tell him that the seal was quietly sleeping in the oven. The poor animal came back over night to his beloved home, crept through an open window, and took possession of his favorite resting-place. The next morning, another cow was reported to be unwell. The seal must now be finally removed. A Galway fishing-boat was leaving port on her return home, and the master undertook to carry off the seal, and not put him overboard until he had gone some leagues beyond Innis Boffin.

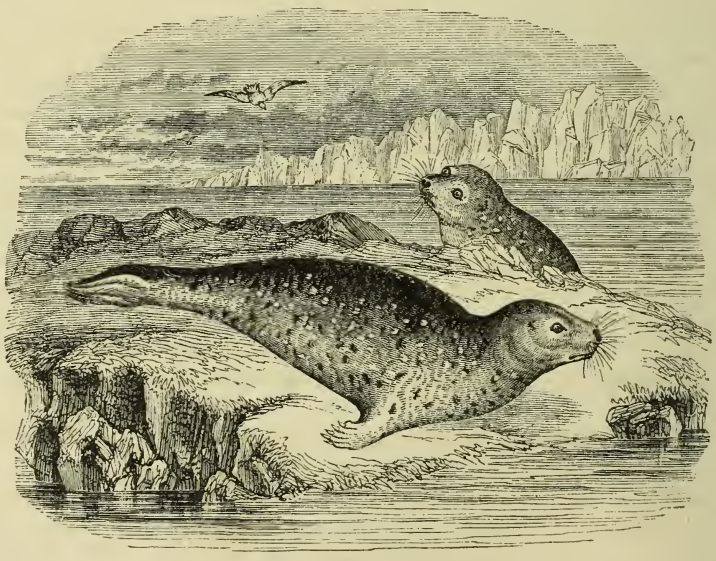
"It was done—a day and night passed; the second evening closed; the servant was raking the

fire for the night; something scratched gently at the door; it was of course the watch-dog; she opened the door, and in came the seal! Wearied with his long and unusual voyage, he testified by a peculiar cry, expressive of pleasure, his delight to find himself at home, then stretching himself before the glowing embers of the hearth, he fell into a deep sleep.

"The master of the house was immediately apprised of this unexpected and unwelcome visit. In this exigency, the old dame was awakened and consulted; she answered that it was always unlucky to kill a seal, but suggested that the animal should be deprived of sight, and a third time carried out to sea. To this hellish proposition the besotted wretch who owned the house consented, and the affectionate and confiding creature was cruelly deprived of sight on the hearth for which he had resigned his native element! Next morning, writhing in agony, the mutilated seal was embarked, taken outside Clare Island, and committed to the waves. A week passed over, and things became worse instead of better; the cattle died fast, and the infernal hag confessed that her arts were useless, and that the destructive visitations upon the cattle exceeded her skill and cure.

"On the eighth night after the seal had been committed to the Atlantic, it blew tremendously. In the pauses of the storm, a wailing noise was at times faintly heard at the door; the servants who slept in the kitchen concluded that the *Banshee* had come to forewarn them of an approaching death, and buried their heads in the bed-coverings. When morning broke, the door was opened: the seal was there, lying dead upon the threshold! The skeleton of the once plump animal—for, poor beast, it perished from hunger, being incapacitated, by blindness, to procure its customary food—was buried in a sand-hill, and from that moment, misfortunes followed the abettors and perpetrators of this inhuman deed. The detestable hag who had denounced the inoffensive seal was, within a year, hanged for the murder of her own grandchild.

"Every thing about the devoted house melted away: sheep rotted, cattle died, and the corn was blighted. Of several children, none reached maturity, and the hard-hearted proprietor survived every thing he loved or cared for. He died *blind* and miserable. There is not a stone of that accursed building standing upon another. The property has passed to a family of a different name, and the series of incessant calamity which pursued all concerned in this cruel deed is as romantic as true."



THE COMMON SEAL.

Genus CALLOCEPHALUS: *Callocephalus* of F. Cuvier.—Of this there are several species, the most noted of which is the Sea-Calf, or Common Seal, *C. vitulinus*, the *Phoca vitulina* of Linnæus, the *Veau Marin* of the French, *Vecchio Marino* of the Italians, *Meerwolf* and *Meerhund* of the Germans, *Lobo Marino* of the Spanish. The ground-color of the hair or skin, when this

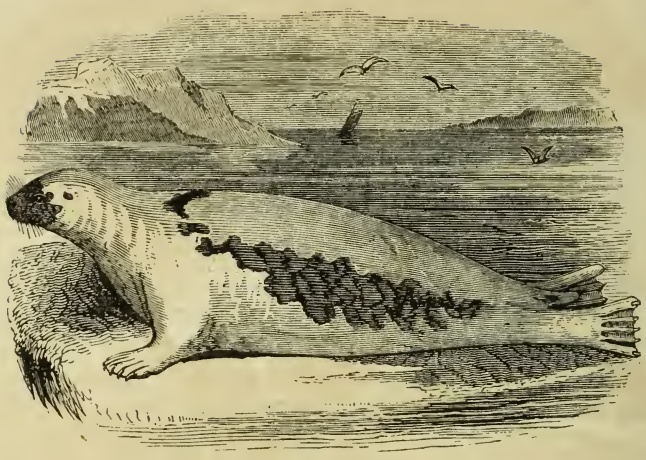
animal is alive and dry, is pale whitish-gray, with a very slight tinge of yellow; when just out of the water and wet, the ground-color is ash; after death, and as seen in museums, the ground-color is pale yellowish-gray, the oil having penetrated the skin, and rendered the hair of a more yellow hue; the body above is clouded and marbled with blackish-gray; space round the eyes and muzzle, sides of the body, all the lower parts and the feet, pale grayish, becoming nearly white beneath. There is some brown on the muzzle and upper part of the tail; whiskers moderate, undulated; claws black, and rather strong; length from three to five feet. It inhabits the northern seas generally, and is occasionally found as far south as England, France, &c., on the eastern coasts of the Atlantic, and as far as the United States on the western.

Farrington, writing to Pennant, gives the following description: "The seals are natives of our coasts, and are found most frequently between Llyn, in Caernarvonshire, and the northern parts of Anglesey; they are seen often toward Carreg-y-Moelrhon, to the west of Bardsey, or Ynys Enlli, and the Skerries, commonly called in the British language Ynys-y-Moelrhoniad, or Seal Island. The Latin name of this amphibious animal is *Phoca;* the vulgar name is sea-calf, and on that account the male is called the bull, and the female the cow; but the Celtic appellative is 'Moelrhon,' from the word *moel*, bald, or without ears, and *rhon*, a spear or lance. They are excellent swimmers and ready divers, and are very bold when in the sea, swimming carelessly enough about boats; their dens or lodgments are in hollow rocks or caverns near the sea, but out of the reach of the tide. In the summer, they will come out of the water to bask or sleep in the sun, on the top of large stones or shivers of rocks, and that is the opportunity our countrymen take of shooting them; if they chance to escape, they hasten toward their proper element, flinging stones and dirt behind them as they scramble along, at the same time expressing their fears by piteous moans; but if they happen to be overtaken, they will make a vigorous defense with their feet and teeth till they are killed."

Dr. Borlase furnishes the following vivid description: "The seals are seen in the greatest plenty on the shores of Cornwall in the months of May, June, and July. They are of different sizes, and feed on most sorts of fish which they can master, and are seen searching for their prey near the shore where the whistling-fish, wraws, and polacks resort. They are very swift in their proper depth of water, dive like a shot, and in a trice rise at fifty yards' distance, so that weaker fishes cannot avoid their tyranny except in shallow water. A person of the parish of Sennan saw not long since a seal in pursuit of a mullet—that strong and swift fish; the seal turned it to and fro in deep water as a grayhound does a hare; the mullet at last found it had no way to escape but by running into shoal water; the seal pursued, and the former, to get more surely out of danger, threw itself on its side, by which means it darted into shoaler water than it could have swum in with the depth of its paunch and fins, and so escaped. The seal brings her young about the beginning of autumn; our fishermen have seen two sucking their dam at the same time, as she stood in the sea in a perpendicular position. Their head in swimming is always above the water, more so than that of a dog. They sleep on rocks surrounded by the sea, or on the less accessible parts of cliffs left dry by the ebb of the tide, and if disturbed by any thing, take care to tumble over the rocks into the sea. They are extremely watchful, and never sleep long without moving, seldom longer than a minute; then raise their heads, and if they hear or see nothing more than ordinary, lie down again, and so on, raising their heads a little, and reclining them alternately in about a minute's time."

The Kassigiack, *C. maculatus*, inhabits the same localities as the preceding, and though somewhat differing in color, is believed to be a variety of the same species.

The Atak, or Harp Seal, *C. Grœnlandicus*—the *Phoque à Croissant* of Buffon—has the hair drier, closer to the leather, and more free from wool than that of the other species; each hair is flat and lustrous. A large brown oblique band, irregularly dentilated, commences nearly above the shoulders, where it joins that of the other side, and is carried along upon the sides and up to the hind-legs, becoming by degrees brighter there, and losing itself in the white of the belly; the posterior extremity approaches that of the other side at the root of the tail. Some small brown spots are scattered about both in the gray of the back and in the pale part of the band. The bands and spots become more and more black with age. The females and the young have the



THE HARP SEAL.

skin of the same ground-color, but without bands, and with unequal, well-defined, angular, brown spots, thrown, as it were, at hazard, on different places of the upper and lower part of the body. The ground-color of the old male is gray-white, and his length is five feet. The face is entirely black. According to Crantz, "when newly born this species is quite white and woolly. In the first year it is cream-colored; in the second, gray; in the third, painted with stripes; in the fourth, spotted; and in the fifth, wears half-moons as the sign of its maturity." It is found in the Frozen Ocean, Greenland, Newfoundland, Iceland, the White Sea, and Kamtschatka.

According to Fabricius, this species is very numerous in the deep bays and the mouths of the rivers in Greenland. They leave the coast twice a year; at first in March, returning in May; again in June, and reappearing in September. Their young—one, rarely two, at a birth—are brought forth in spring, and are suckled on the ice far from shore. They avoid the fixed ice, but live and sleep in vast herds near the floating ice-islands, among which they are sometimes seen swimming in great numbers, under the guidance of one who seems to act as leader and sentinel for the whole. Their food consists of all kinds of fish, shell-fish included, but they prefer the arctic salmon. When on the feed, and one comes to the surface to breathe, he lifts his head only above the water, and quickly dives without changing his place. These seals swim in many attitudes, on their back, on their sides, as well as in the ordinary position, and occasionally whirl themselves about, as if in sport. They sleep frequently on the water, and are considered incautious, especially on the ice.

They are said to have a great dread of the toothed whales. If a grampus perceive a seal of any species basking on floating ice, it is asserted that he does his best to upset the ice or beat the seal off with his fins, when the latter becomes an easy prey.

Crantz avers that this is a careless, stupid seal, and that it is the only one which the Greenlander will venture to attack alone. He goes to hunt it in his kajak, which is in the form of a weaver's shuttle. When he perceives a seal, he endeavors to surprise it unawares, with the wind and sun in his back, that he may be neither heard nor seen. He approaches it rapidly, but silently, till within four or six fathoms. He then takes hold of the oar in his left hand, and with his right throws the harpoon. If it is fixed, the Greenlander throws the attached buoy overboard on the same side that the seal dives, and he dives upon the instant. The struck victim often carries the buoy under water, but, wearied and wounded, it must at last come up to breathe. The Greenlander, who is on the watch, now attacks it with his long lance till the animal is exhausted, when he releases it from its sufferings with his short lance, and then blows it up like a bladder that it may swim the easier after his kajak. This is a service of danger to the seal-hunter. If the line should be entangled, or if it should catch hold of the kajak, an oar, the hunter's hand, or his neck, as it sometimes does when the wind is high, or if the seal should make a sudden turn



A GREENLANDER SPEARING A SEAL.

to the other side of the light boat, the kajak would be drawn under the waves. Then, unless the Greenlander has presence of mind and dexterity to disentangle himself, he is lost. Nor is this all the danger, for the dying seal may attack him; and if it be a female followed by young ones, she will not unfrequently turn on the pursuer, injure him, or bite a hole in his kajak and sink it.

The MARBLED SEAL, *C. discolor*.—This seal is a native of the coasts of France, and was at first thought to be a variety of *C. vitulinus*, or one of that species exhibiting a modification of color from age or sex. Cuvier observes that it does not appear to be a variety of the last named species, proceeding from age and sex only; but he adds, that its cranium does not show a sensible variation from that of the common seal. Professor Nilsson regards it as a distinct species, giving it the name of *C. annellatus*. It was one of this species in the Garden of Plants at Paris of which we have given M. F. Cuvier's interesting description.

Other species of this genus are the KENALIT or *C. Oceanicus* the WHITE-TAILED SEAL, *C. albicaudus;* the *C. lagurus;* the ROUGH SEAL, or NEITSEK, *C. hispidus;* the URKSUK, *C. barbatus;* THIENEMAN'S SEAL, *C. scopulicolus;* the *C. leucopla*, and the SHORE SEAL, *C. littoreus*.

Genus STENORYNCHUS: *Stenorynchus*.—Of this there are two species, the SMALL NAILED SEAL, *S. leptonyx*, a native of the Falkland Islands and New Georgia, and the SEA LEOPARD, *S. leopardinis*, found in the South Shetland Islands. We have little knowledge of either species.

Genus PELAGIUS: *Pelagius*.—Of this there is a single species, the MONK SEAL, *P. monachus*, seven to twelve feet long, and found in the Adriatic. It is that species whose skins were always carried before the Emperor Augustus as a protection against lightning, the Romans generally regarding seal-skins as possessing this protective power.

Genus STEMMATOPE: *Stemmatopus*.—Of this there is a single species, the CRESTED, or HOODED SEAL, *S. cristatus*, remarkable for possessing, about two inches from the extremity of the upper jaw, on the superior surface, a cartilaginous crest, which rises, increasing rapidly in height as it passes backwards, about seven inches high at its posterior or vertical edge, which is separated into two planes by an intervening depression an inch deep. The superior edge is slightly convex, and the whole structure is an elongation of the septum of the nose, the true nostrils opening on each side of it by an oblong figure. This crest runs into the hood or sack-like appendage of the head. The hood is strongly muscular, with an aggregation of circular fibers round its external orifices, which are two, situated at the lower anterior part of the head. The females and young have the crest in a very rudimentary state. The length is eight feet.



THE HOODED SEAL.

This species is found on the coasts of Greenland and of North America down to the United States. It especially haunts the open sea, and is said chiefly to visit the land in April, May, and June. They are found for the most part on large ice-islands, where they sleep without precaution; and occur in great numbers in Davis's Straits, where they are stated to make two voyages a year, in September and March. They depart to bring forth their young, and return in June very lean and exhausted. In July they proceed again to the north, where they appear to procure plenty of food, for they return in high condition in September. The crested seal is said to be polygamous, and to have its young on the ice. Its bite is formidable, and its voice is stated to resemble the bark and whine of a dog. When surprised by the hunter, it weeps copiously. Among themselves they have fierce encounters, and inflict deep wounds in the conflicts, with their claws and teeth.

This is one of the species pursued by the seal-hunters, and together with the *Rough Seal*, furnishes the greatest number of skins taken to the markets of Great Britain. The natives of the coasts of Greenland, Labrador, &c., clothe their women with the skins of the young, and cover their boats and houses with the skins of the old ones. They head their hunting-spears with the teeth, and blow up the stomachs into fishing buoys.

Genus MACRORHINUS: *Macrorhinus* of F. Cuvier.—Of this there is one species, the SEA ELEPHANT and *Elephant Seal* of the English; the *Phoque à trompe* of Péron; the *Elephant marin* of the French, and *Bottle-nose* of Pennant; the *M. proboscideus* of naturalists. The animals of this species are remarkable for the nose of the male being prolonged into a kind of proboscis, which respires violently when the creature is excited, and is elongated in the form of a tube about a foot long when it is preparing for attack and defense. When the animal is in a state of repose it is shrunk, and the proboscis is flaccid, giving the face a large and puffed appearance. The female is not provided with this ornamental feature. This species is found in the southern hemisphere, both in the Atlantic and Southern Oceans, between 35° and 55° south latitude, at Kerguelen's Land, South Georgia, Juan Fernandez, South Shetland Islands, and Falkland Islands. A few are captured near the Cape of Good Hope, and on the coasts of Chili and Patagonia and New Holland.

This enormous animal, which, to use the expression of Mr. Lizars, "compared with any ordinary seal three or four feet long, appears like an elephant when compared to a sheep," owes its name to its size and bulk, most probably, quite as much as to the proboscis with which the male

is furnished. These seals—though living mainly in salt water—are fond of wallowing in fresh-water swamps, and resort to lakes and rivers connected with the sea, whose waters they drink with apparent pleasure. They sleep both afloat and on the sands of the shore: when a flock reposes in the latter situation, some of them keep watch, and if alarmed, down they go to the sea. Those who have seen them in progress describe their gait as very singular, their motion being a kind of crawling, during which their body trembles like a great bag of jelly. At every fifteen or twenty paces they halt, as if from fatigue. If any one gets before them, they stop, and if urged to motion by repeated blows, appear to suffer much, and the pupil of the eye, which is ordinarily bluish-green, becomes blood-red. Notwithstanding their unwieldiness, however, they have been known to ascend low downs of fifteen or twenty feet elevation, in order to reach small ponds of water.

The cry of the female and of the young is said to resemble the lowing of an ox, but the hoarse, gurgling, singular voice of the male, strengthened by the proboscis, is described as being audible to a great distance, and as wild and frightful. To obtain shelter from the heat of the sun, when lying on the shore by day, they cover themselves, by the aid of their paws, with the moist sand. They perform a sort of migration by sea in order to avoid the extremes of heat and cold, leaving the south in the beginning of winter for more temperate climes, and retiring southward again in summer. About a month afterward, the females bring forth one, very rarely two, according to Péron; generally two, according to Anson. The young weigh about seventy pounds, and are between four and five feet long at their birth, the male, even at that early period, being larger than the female. At this time, it is stated that the mothers are all collected near the shore, surrounded by the males, who prevent them from returning to sea till the period of suckling is past, during which operation the female lies on her side. The young grow so rapidly that they are said to double their original dimensions in eight days, and at the end of the third year they have attained a length of from eighteen to twenty-five feet and upwards, when they increase principally in fatness. At this period the proboscis appears in the male. Six or seven weeks elapse before the young are conducted to sea, to familiarize them with which the whole troop abandon the shore, swimming about for three weeks or more, when they return to the coasts for the purpose of breeding. The young males stay with the females till their proboscis is developed, announcing that they have arrived at maturity. During the breeding season, bloody battles take place among the males, in which they are often severely wounded, but rarely killed, while the females calmly wait the issue, and receive the conqueror. The period of gestation is said to be nine or ten months.

They are a harmless race, never attacking man unless in defense of themselves and their young. One of Anson's sailors lost his life by exasperating a mother, in whose presence he skinned her young one. Their disposition is, however, gentle and affectionate; and a young one, petted by an English seaman, became so attached to his master from kind treatment for a few months, that it would come at his call, allow him to mount upon its back and put his hands into its mouth. Their length of life is estimated at twenty-five or thirty years.

Their tongues, when salted, are considered savory and wholesome; the flesh, according to some, is black, oily, and indigestible; others represent it as palatable and nutritious. The heart, though tough and hard, is sometimes eaten, but the liver appears to be unwholesome. The skin, though not valued for its fur, is extensively used for carriage and horse harness, on account of its thickness and strength. But the oil is the great object for which the animal is hunted.

Genus ARCTOCEPHALUS: *Arctocephalus.*—Of this, one of the most noted species is the Sea-Bear, *A. ursinus:* the *Ours Marin* of Buffon; the *Ursine Seal* of various authors. It is the size of a large bear; girth at the shoulder, five feet, near the tail, twenty inches; fur brown, acquiring a grayish tint at the point of the hairs in old age; external ears one inch eight lines long, conical, erect, covered with short hair, and opening by an oblong slit, which is shut in the water; nails very slender and minute; length seven and a half feet. It is found on the islands at the northwest point of America, at Kamtschatka, and the Kurile Islands.

When these migratory seals appear off Kamtschatka and the Kuriles, early in the spring, they are in high condition, and the females are pregnant. They remain on or about the shore for two



SEA-BEAR.

months, during which the females bring forth. They are polygamous, and live in families, every male being surrounded by a crowd of females—from fifty to eighty—whom he guards with the greatest jealousy. These families, each including the young, amounting to 100 or 120, live separate, though they crowd the shore, and that to such an extent on the islands of the northwest coast of America, that it is said they often oblige the traveler to quit it and scale the neighboring rocks. Both male and female are very affectionate to their young, and fierce in their defense; but the males are often tyrannically cruel to the females, which are very submissive. If one family encroaches on the station of another, a general fight is the consequence. They will not, in fact they dare not, leave their stations, for if they did they must encroach on that of some other family. Steller relates that he had been beset by these seals for six hours together, and was at last obliged to climb a precipice to get rid of the infuriated animals, at the imminent peril of his life. They have their war-notes and several other intonations. When amusing themselves on the shore, they low like a cow or chirp like a cricket, after a victory, and when they are wounded, cry like a whelp. They swim very swiftly, and are as great a terror to other seals as the sea-lion is to them. The skin, which is very thick, is covered with hair, like that of the common seal, but a great deal longer, standing erect, and being very compact. The skins of the young are highly prized for clothing.

The Fur-Seal, *A. Falklandicus*, is one of the most remarkable of the seals. The skin is covered with two different substances; the longest consists of hair of a grayish color, and when this is pulled out, there is left that fine, soft, close, yellowish fur, which was once so commonly made into caps for boys. It was formerly a very common species on the shores of the Falkland Islands, and other groups of islands in the southern seas. Captain Weddell, in his "Voyage towards the South Pole," has given the best description of the habits of this seal. The male is nearly twice the size of the female. About the middle of November the males go on shore to wait the arrival of the females, who soon follow, to bring forth their young; the males, at this period, have many battles, and during the gestation of their partners are most assiduous protectors of them. The female has seldom more than one at a birth, which she suckles and rears with great affection. After the young one has been taught to swim by its mother, it is left on shore, and remains there till its coat of fur and hair is fully grown. At first, the young are black, but in a few weeks they become gray, and immediately after acquire their full costume. Their senses



KILLING SEALS.

of smell and hearing are acute, and their instincts are as perfect as those of the common seal of our seas.

When the islands frequented by these seals were first visited by voyagers, the poor animals had not the slightest fear of man: they would lie quite still, while their comrades were knocked on the head and skinned; but in a few years they got intimidated, and placed themselves on rocks, from which, unless intercepted, they could immediately dive into the sea. Weddell says that "the agility of this creature is much greater than from its appearance an observer would anticipate. I have seen them, indeed, often escape from men running fast in pursuit to kill them." He refutes the absurd story that seals can defend themselves, somewhat as the Parthians did, by propelling stones, backward, at their pursuers. It was said that the seals threw them with their tails; he explains it in this way, that, when the animal is chased on a stony beach, it advances 'by drawing the hind-flippers forward, thereby shortening the body and projecting itself by the tail, which, when relieved by the effort of the fore-flippers, throws up a quantity of stones to the distance of some yards."

In the years 1821 and 1822, the number of fur-seals taken on the shores of the South Shetland Islands, by the vessels principally of the English and Americans, was no fewer than three hundred and twenty thousand; and Weddell has shown that a hundred thousand skins might have been procured yearly for a considerable period, but for the recklessness of the hunters, who killed the mothers before the young were able to take to the water, and pursued and took seals of every denomination. "By this means, at the end of the second year, the animals became nearly extinct; the young, having lost their mothers when only three or four days old, of course all died, which, at the lowest calculation, exceeded 100,000." Captain Carmichael observes, that, owing

to the fore-feet in this species being placed near the center of the body, it can sit erect, in an attitude much resembling that of a penguin.

Genus OTARIA, or PLATYRHYNCHUS: *Platyrhynchus.*—As several species of large seals have been confounded under the name of *Sea-bear*, so several have been included under the title of SEA-LION. One of these, described by Forster, *P. marinus*, belonging to this genus, has a thick skin; hair reddish, yellowish, or dark brown; no fur or short woolly hair under the long hair; a mane on the neck of the male reaching to the shoulders; head small in proportion to the body, which is everywhere equally thick-looking, as Buffon describes it, "like a great cylinder, more suited for rolling than walking;" ears conical, about six or seven lines long, cartilage firm and stiff, but yet rather curled at the margin; upper lip overhanging the lower, both furnished with long, coarse, black whiskers, which become white with age; length from ten to fourteen feet; the females shorter and more slender. It is found along the shores of the Antarctic islands. Another species of sea-lion is the *O. jubata*, found in Kamtschatka and the Kurile Islands; a third, the *O. leonina*, is found in the Falkland Islands. Some authors also mention the LITTLE SEA-LION, *Otaria molossina*, and the *O. Guerinii*, both of the Falkland Islands.



FIGHT WITH A SEA-LION.

These animals, even if of different species, seem to have a great resemblance. Captain Cook states that he did not find it perilous to go among them, for they either fled or stood still. The only danger was in going between them and the sea; for if they took fright at any thing they would come down in such numbers that the person in the way would be run over. When he and his party came suddenly upon them, or waked them out of their sleep, they would raise up their heads, snort and snarl, and look fierce, as if they meant to devour the intruder; but when the men advanced, the sea-lions always ran away. He states that the male is surrounded by twenty or thirty females, and that he is very careful to keep them all to himself, beating off every male that attempts to come to his flock. Others again had a less number, some no more than one or two; and here and there was seen one lying growling in a retired place, suffering neither males nor females to come near him. These he judged to be old and superannuated.

Forster relates that the rocks along the shore in New Year's Harbor were covered with multitudes of sea-lions. He says that they were often seen to seize each other with an indescribable degree of rage, and that many of them had deep gashes on their backs, which they had re-

ceived in the wars. The younger active sea-lions, with all the females and the cubs, lay together. When undisturbed, they were often observed caressing each other in the most tender manner, and their snouts met together as if they were kissing. The same author states that they come on shore on those uninhabited spots to breed, and that they do not feed during their stay on land, which sometimes lasts for several weeks; they then grow lean, and swallow a considerable quantity of stones to distend the stomach. He adds that the stomachs of many of them were found entirely empty, and those of others were filled with ten or twelve round heavy stones, each of the size of the two fists.

These animals appear to be much less numerous than formerly; they have also, no doubt, somewhat changed their habits since the time of Cook, for recent voyagers speak of severe battles with these huge beasts on the shores of the Antarctic islands.

Genus HALICHŒRUS: *Halichœrus.*—Of this genus is the Gray Seal, *H. gryphus*, found in the Baltic and along the coasts of Ireland, and thence northward to Iceland. Its coat is white and silky; it goes in small parties, which bark somewhat like dogs. The length is seven to eight feet. There are said to be several other species of this kind of seal, among which is the *H. Antarcticus*, but they have not been verified.

. It may be added generally, that there are doubtless some species of seal not known to naturalists, and not included in the preceding enumeration; but the most remarkable and interesting kinds, especially those of commercial importance, will be found in the account we have given. It may be well to state, however, that some naturalists mention the following species: Tortoise-Head Seal, *Phoca testudinea*, inhabiting the European seas; the Lakhtak, *P. Lakhtak*, found on the shores of Kamtschatka; the Tiger-Seal, or the Sea-Dog, *P. punctata*, or *P. maculata*, or *P. nigra*, found along the Kurile Islands and Behring's Straits; the Sea-Wolf, *Phoca pusilla*, or *P. parva*; the *Otaria cinerea*, and the *O. albicollis*, all found in the Australian waters; the *O. coronata*, and *O. flavescens*, their locality not known; the Sea-Hog, *O. porcina*, inhabiting the coasts of Chili, and the *O. Hauvillii*, found in the Falkland Isles.



THE WALRUS.

Genus WALRUS: *Trichecus.*—Of this there is a single species, *T. rosmarus*, which has the various English names of Morse, Sea-Horse, and Sea-Cow; the French give it the titles of *Vache marine*, *Cheval marin*, and *Bête à la grande-dent*. It differs in many particulars from the seals, and especially in the cranium and teeth. In the adult lower jaw there are neither incisors nor canines, and the lower jaw itself is compressed anteriorly, so as to fit between the two enormous tusks or canines of the upper jaw, which are sometimes two feet long and proportionably thick, and directed downwards. The great alveoli, or sockets for containing these formidable teeth, produce the characteristic form of the skull of the walrus, and make the anterior part of the upper jaw present an immense convex muzzle, the nostrils having an upward direction, and not terminating at the

snout. All the molars are cylindrical, short, and truncated obliquely. Between the two canines are two incisors similar to the molars, but Cuvier observes that the greater number of authors have not considered them as incisors, although they are implanted in the intermaxillary bone; and between them, besides, in young individuals, are two small and pointed teeth. In most other respects there is a general resemblance between the organization of the walrus and that of the seal; but the development of the brain is not so great in the former as it is in the latter, and the walrus appears not to be gifted with so high a degree of intelligence as the seal, though it is far from being stupid. In its formation the neck is short, body bulky, broadest round the chest, and diminishing toward the very short tail; hair close; color varying with age, the young being black, then becoming brown, and gradually paler and paler, till the animal in old age becomes white; limbs very short; inside of the flippers defended by a horny kind of coat, or callus, produced, in all probability, by climbing over ice and rocks; length from ten to fifteen, or even twenty feet in the case of the largest bulls; girth eight or ten feet and upwards; length of the tusks when cut out of the skull generally from fifteen to twenty inches, sometimes thirty inches, and their weight from five to ten pounds. It seems to be nearly omnivorous, devouring chiefly marine vegetables which adhere to the bottom of the sea, and using its tusks for grubbing them up; it also feeds on herrings and smaller fishes, shrimps, craw-fish, and the like. It is a native of the Northern Ocean, Spitzbergen, Nova Zembla, Hudson's Bay, Gulf of St. Lawrence, Bhering's Straits. In some places it is seen in groups of several hundreds.

The tusks are a great help as ice-hooks or grapplings in assisting the animal to climb upon the ice from the sea. Though they swim so rapidly that it is difficult to follow them with boats, their progress on land is awkward and tedious; their gait being a kind of jerking, probably like that of the seals, but they can make considerable springs, and advance pretty rapidly with the help of their teeth. They appear to be monogamous, and consequently are exempt from the terrible combats which are the result of the jealousies of the polygamous seals. The female is said to bring forth her young, one only at a birth, either on shore or on the ice. When born, the young is about the size of a year-old pig. Till taught by fatal experience, the walrus seems to be a fearless animal, and to be undismayed by the face of man; but he soon learns his lesson of distrust. Still the animal is not incautious, for Captain Cook never found the whole herd asleep, some being always on the watch. These, on the approach of the boat, would rouse those next to them, and the alarm being thus gradually communicated the whole herd would presently awake. In the North Pacific Ocean he got entangled with the edge of the ice, on which lay innumerable sea-horses. They were lying in herds of hundreds, huddling one over the other like swine, and were roaring and braying very loud; and indeed in the night or in foggy weather they gave the voyagers notice of the vicinity of the ice before it could be seen. They were seldom in a hurry to get away till after they had been once fired at, when they would tumble over each other into the sea in the utmost confusion. Vast numbers of them would follow the boats and come close up to them, but the flash in the pan of a musket sent them down instantly. Before they were put upon their guard by persecution as many as three or four hundred were killed at a time.

That they are not without courage, or sympathy for their wounded companions, there is ample testimony. When Martens wounded one, others speedily surrounded the boat, and while some endeavored to pierce it with their tusks, others raised themselves out of the water and endeavored to board her. Captain Phipps, afterwards Lord Mulgrave, relates that when near a low flat island opposite Waygat's Straits, in 1773, two of the officers went in a boat in pursuit of sea-horses. They fired at one and wounded it. The animal was alone when it was wounded, but diving into the sea it brought back a number of others. They made a united attack upon the boat, wrested an oar from one of the men, and were with difficulty prevented from staving or upsetting her; but a boat from the Carcass joining that from the Racehorse, they dispersed. Captain Phipps adds that one of that ship's boats had before been attacked in the same manner off Moffen Island.

Sir Edward Parry encountered about two hundred in Fox's Channel, lying piled as usual over each other on the loose drift-ice. A boat's crew from both the Fury and the Hecla went to attack them, but they made a desperate resistance, some with their cubs mounted on their backs; and

one of them tore the planks of a boat in two or three places. Their parental affection is great. Captain Cook states that on the approach of the boats to the ice all the walruses took their cubs under their fins, and endeavored to escape with them into the sea. Several, whose young were killed and wounded, and were left floating on the surface, rose again and carried them down, sometimes just as the people were going to take them into the boat; and they might be traced bearing them to a great distance through the water, which was colored with their blood. They were afterwards observed bringing them up at times above the surface, as if for air, and again diving under it with a dreadful bellowing. One female in particular, whose young had been destroyed and taken into the boat, became so enraged that she attacked the cutter, and stuck her tusks through the bottom of it.

That the walrus is capable of a degree of domestication, in youth at least, appears from sufficient testimony. The flesh is highly valued by the inhabitants of the Arctic regions, nor does it seem to have come amiss to northern voyagers. Cook and his crew lived upon it as long as it lasted, and there were few on board who did not prefer it to salt meat. Sir Edward Parry remarks that the flesh was found tolerably good, affording a variety amid the ordinary sea fare. But the tusks, the skin, and the oil are the parts and products for which the walrus is more particularly hunted. The ivory of the first is highly esteemed, and is used in Europe and America for artificial teeth. The skins make excellent carriage-braces, and are useful about shipping, making very good wheel-ropes, &c. The oil is more valued than that of the whale, though not more than twenty or thirty gallons are afforded by one animal.

It is not improbable that some of the stories of Mermen and Mermaids have taken their origin from those who have seen walruses or seals with their heads lifted out of the water. The former, before their tusks have grown, in such a situation, bear a strong resemblance to the human head, especially when observed from a distance.



BEAVERS.

ORDER 7. **RODENTIA.**

The *Rodentia* or *Gnawing animals*, are all of small size, many of them the most diminutive of their class; but the species are exceedingly numerous, and usually very prolific, so that no mammalia are more generally or abundantly distributed. Their most conspicuous character is to be found in their dentition, which is very peculiar. The teeth are of two sorts, incisors and molars, the canine teeth being entirely deficient. The incisors are two in number in each jaw; their bases pass far into the jaw, where usually, beneath the molar teeth, there is a permanent pulp, by the action of which the incisors are kept constantly growing during the life of the animal, so as to supply the continual wear going on at the extremities, where the upper and lower teeth come in contact. The substance of the body of these teeth is moderately soft, but their anterior surface is covered with a layer of very hard enamel, secreted by a membrane coating the anterior wall of the socket. The thin layer of hard enamel which coats the front of the tooth resists abrasion much better than the dentine of which the body of the tooth is composed; the latter consequently wears away most rapidly, and thus the enamel always constitutes a sharp projecting edge like that of a chisel, of which the dentine forms the beveled portion.

The object of this arrangement is very apparent. These animals feed to a great extent upon hard substances, or substances inclosed in hard coverings, such as nuts, &c.; and in order to get at their food they require both sharp and strong teeth; the requisite sharpness is furnished by the thin plate of enamel; but as this by itself would break away directly when applied to its ordinary purposes, it is strengthened by a thick layer of dentine, which, although it furnishes the necessary support, wears away so readily as never to interfere with the efficiency of the cutting edge.

Behind the incisors there is a large gap, beyond which the molars are situated. These vary in number from two to six, and are usually destitute of true roots; in fact, like the incisors, they generally continue growing throughout the animal's existence. They are often composed of a simple prism of dentine coated with enamel; the latter is sometimes folded so as to produce transverse ridges at the surface of the tooth, which is usually worn flat, and in some cases exhib its small isolated spots of enamel in the body of the dentine. These teeth are evidently adapted

for the comminution of vegetable substances, and although many of these animals are omnivorous, there is no doubt that vegetable matters constitute the principal part of their nourishment.

The skull is small, and the jaws, especially the lower one, large and strong. To give full action to the gnawing incisors, the lower jaw is articulated to the skull by an elongated condyle, which allows it to move freely backward and forward. The head is more or less rounded, with the snout pointed, and usually furnished with long moustaches. The opening of the mouth is small, but the cheeks often form large pouches, in which the animals can convey food to the hoards which they lay up in their dwelling-places. The brain is small, and exhibits scarcely any convolutions, and the cerebellum is almost entirely exposed. The legs are generally short, and adapted either for walking or climbing; the feet are furnished with four or five free toes, armed with nail-like claws; but the thumb is never opposable. The eyes and external ears are usually of moderate size, but the latter sometimes attain a great length. The skin is generally covered with soft hair, but in some cases with bristles and spines. The tail varies greatly in its development, and is sometimes naked or scaly, and sometimes covered with hair.

The rodents are distributed in all parts of the world, even New Holland possessing apparently indigenous species. Very few are domesticated; but the flesh of some species is eaten, while the skins of others are sought after as furs. Notwithstanding their small size, their great numbers, their habit of storing up large quantities of provisions, and their extraordinary propensity for gnawing, cause them to commit great devastations in many places.

THE LEPORIDÆ.

The immense number of species included in the order of rodentia has necessitated the formation of numerous families. The first is that of the *Leporidæ*, or Hares, including the Rabbits, and the *Lagomys*, or Calling-hares, and which are at once distinguished from all the other rodents by the possession of a small additional incisor behind each of the two large chisel-like incisor teeth in the upper jaw. They also present several other remarkable characteristics, among which we may notice that the orbits communicate with each other through an aperture in the septum, a structure which is characteristic of the class of birds. The maxillary bones are pierced with numerous sieve-like holes, a character which is otherwise peculiar to the ruminants. The molar teeth have a transverse ridge of enamel, so that they appear to be composed of two halves; they are usually six in the upper and five in the lower jaw, but in some species the upper jaw has only five molar teeth. The leporidæ are all strictly herbivorous animals.

Genus HARE: *Lepus*.—Of this there are numerous species. The Common Hare of Europe, *L. timidus*, has the inside of the mouth hairy; the tongue and nose are very thick; the upper lip is cleft to the nostrils, which seem to unite, and to form a single opening; the eyes, which are very prominent, are furnished with a nictitating membrane; the feet are covered beneath, as well as above, with fur; the heart is proportionably large, and the cæcum about six times as large as the stomach. Under the Mosaic dispensation, when various animals were described as clean or unclean, according to the Levitical ritual, the hare is described as "chewing the cud," that is, as being a ruminant animal. That the hare is not a true ruminant, furnished with the compound stomachs of that class of animals, is certain; but still it says not a little for the truth of the Bible's natural history, that the hare is still a partial ruminant, and that, while she sits on her form, she can occasionally bring up a portion of her food, and give it a second mastication.

Hares of this species are common in most parts of Europe, though they vary considerably in size in different places. Generally speaking, they are smaller in hot countries than in cold: and we might expect this, because the general investiture of the whole body, feet and all, with fur, naturally points out the hare as more an animal of cold, or, at least, temperate countries, than of warm ones. It has been observed, however, that in places not very different from each other, either in climate or in situation, there are great differences of appearance in the common hare. We shall afterward have occasion to advert to the Irish hare, which recent observation has shown to differ from the hare of Britain, near as the islands are to each other; but we may mention, that a very small breed exists in the island of Islay, on the west coast of Argyleshire, and a



HARE AND RABBITS.

very large one on the Isle of Man, where individuals have been taken that weighed twelve pounds. In England examples occur of hares weighing from ten to eleven pounds; but from some of the rich districts in the east of England hares of much greater weight are frequently sent to the London markets, some weighing as much as fourteen and fifteen pounds.

The kind provisions of nature for the preservation of this race of animals are numerous, and calculated to command our admiration; they also afford a striking proof, among thousands

which might be adduced, of that system of compensations, that balancing of perfections and defects, that equalizing of the quantity of life and destruction, on which the continued existence of the respective tribes of animals depends. On the one hand, if the hare is exposed to the attacks of beasts of prey, on the other it is abundantly fruitful; and, if often pursued, it is also furnished with various sources of evasion and escape. Its ears are so contrived as to convey even remote sounds from behind; and the eyes, as already mentioned of the class generally, are so situated as to enable it, when it rests on its seat, to observe without difficulty, and even without much motion of the head, a whole circle; and, though it sees but imperfectly in a straight line forward, it can direct its vision to whatever threatens it in the way of pursuit, and the eyes are never entirely closed while the animal sleeps. From the powerful muscularity of its limbs, it can sustain the fleetness of its course for a considerable time, while the greater length of the hinder legs gives it such a decided advantage in ascending, that, when started, it always makes to the rising ground.

Its habitual timidity, and perpetual apprehension of danger, preserve it lean, and in a condition the best adapted to profit by that speed which forms its security. In dry or frosty weather, the thick hairy covering to its feet also gives it an advantage over the dog which pursues it, and its close approach in color to the soil often conceals it from the sight of man and predacious animals. As if conscious of its resemblance to the earth on which it treads, it has frequently been known, when closely pursued by the hounds, to squat immediately behind a clod, and suffer the dogs to run over it, which they no sooner do than it instantly starts off in a contrary direction, and thus deceives and eludes them. As it possesses the sense of smell in a pre-eminent degree, it is often aware of the presence of an enemy before it can ascertain its danger by sight. The doublings of its course are familiar to every sportsman; and though its sagacity seems to be in some respects at fault, especially in exhausting its strength in the early part of the chase, and in returning to its resting-place by the same paths, it has been frequently observed to have recourse to stratagems, which in the human being would bespeak not only presence of mind, but a prompt and practical application of the reasoning principle.

If undisturbed, the multiplication of hares would prove greater than that of most quadrupeds; for at all seasons they are capable of breeding, and from the first year of their existence, while the term of gestation does not exceed thirty-one days, there being from two to five at a birth. These are born well covered with hair, and with their eyes open. The hunters allege that when the produce consists of more than one, each leveret is marked with a star-like appearance on the forehead, which usually disappears with the first shedding of the coat, but sometimes continues to a more advanced period. Sir Thomas Brown, in his "Treatise on Vulgar Errors," asserts, from his own observation, that female hares frequently have in their ovaries, at the same time, young ones of different ages, and that after those which are mature are brought forth, others remain which are very far from the term of their exclusion. This phenomenon of superfœtation in the hare is confirmed by Buffon, who has explained it upon anatomical principles. However, the observation is at least as old as Herodotus.

The breeding-place is usually under a tuft of grass, or high brake, a bush of heath, brushwood, or standing corn. The young are suckled by the dam for about two weeks, after which they separate, and procure their own food, making their forms at sixty or seventy paces from each other; so that, when we meet with one young hare, we may be pretty certain of finding more within a very short distance. The hare arrives at maturity in one year, and is supposed to live eight or nine years; but it is presumed that a small number, comparatively, are allowed to die of old age, for dogs of all kinds pursue them by instinct; the cat and the weasel tribes are constantly lying in ambush, and practicing their wary arts to seize them; while birds of prey are still more formidable enemies, as against them no swiftness can avail, no retreat afford security; and lastly, man, more powerful than all, sacrifices great numbers for his pastime or his subsistence.

That the hare is, occasionally at least, an accomplished and bold swimmer, is manifest from the following account, related by Mr. Yarrell in Loudon's Magazine: "A harbor of great extent on our southern coast has an island near the middle of considerable size, the nearest point of which is a mile distant from the mainland at high water, and with which point there is frequent communication by a ferry. Early one morning in spring, two hares were observed to come down

from the hills of the mainland toward the sea-side, one of which from time to time left its companion, and proceeding to the very edge of the water, stopped there a minute or two, and then returned to its mate. The tide was rising, and after waiting some time, one of them, exactly at high water, took to the sea, and swam rapidly over in a straight line to the opposite projecting point of land. The observer on this occasion, who was near the spot, but remained unperceived by the hares, had no doubt they were of different sexes, and that it was the male that swam across the water, as he had probably done many times before. It was remarkable that the hares remained on the shore nearly half an hour, one of them occasionally examining, as it would seem, the state of the current, and ultimately taking to the sea at that precise period of the tide called slack-water, when the passage across could be effected without being carried by the force of the stream either above or below the desired point of landing. The other hare then cantered back to the hills."

Of the common hare there are sometimes accidental varieties; there is a specimen of one of these in the museum of the Zoological Society of London. Albinos are not uncommon. All attempts to promote a breed between the hare and rabbit appear to have been hitherto fruitless.

The hare is rarely found in very hilly or mountainous situations; neither is it often found in places much exposed to the wind, especially when it blows from the north or south; its favorite residence being in rich and somewhat dry and flat grounds. The hare-finders and shepherds remark that the hares on the downs have a variety of seats, which they shift from time to time, as the weather directs, generally ascending to the more elevated grounds when rain prevails. Their food consists of various vegetables, but they seem to prefer those of a milky, succulent quality, and to be very partial to pinks, carnations, parsley, birch, and laburnum. They will prey on the bark of almost every tree during winter, and they are often very injurious to young plantations. Their cry, which has been compared to that of an infant, is seldom heard, except in cases of distress or surprise. They are taken in some countries by a call imitative of that between the male and female.

The hare is naturally of a gentle disposition, although not very susceptible of strong attachment, and when taken young, may be tamed with little difficulty. Shy and timid as it undoubtedly is in its native haunts, yet, when domesticated, it often assumes a forward, and even a petulent demeanor, as has been finely exemplified by Cowper in his account of three which he watched himself. The names he gave them were Puss, Tiney, and Bess. Tiney was a reserved and surly hare; Bess, who was a hare of great humor and drollery, died young. "Puss grew presently familiar, would leap into my lap, raise himself upon his hinder feet, and bite the hair from my temples. He would suffer me to take him up and carry him about in my arms, and has more than once fallen fast asleep upon my knee. He was ill three days, during which time I nursed him, kept him apart from his fellows that they might not molest him,—for, like many other wild animals, they persecute one of their own species that is sick,—and by constant care, and trying him with a variety of herbs, restored him to perfect health. No creature could be more grateful than my patient after his recovery, a sentiment which he most significantly expressed by licking my hand, first the back of it, then the palm, then every finger separately, then between all the fingers, as if anxious to leave no part of it unsaluted; a ceremony which he never performed but once again upon a similar occasion.

"Finding him extremely tractable, I made it my custom to carry him always after breakfast into the garden, where he hid himself generally under the leaves of a cucumber vine, sleeping or chewing the cud, till evening; in the leaves also of that vine he found a favorite repast. I had not long habituated him to this taste of liberty, before he began to be impatient for the time when he might enjoy it. He would invite me to the garden by drumming upon my knee, and by a look of such expression as it was not possible to misinterpret. If this rhetoric did not immediately succeed, he would take the skirt of my coat between his teeth and pull at it with all his force. Thus Puss might be said to be perfectly tamed, the shyness of his nature was done away, and, on the whole, it was visible by many symptoms, which I have not room to enumerate, that he was happier in human society than when shut up with his natural companions."

As an article of food, the flesh of the hare has been in high esteem from very remote antiquity;

and notwithstanding the additions which modern luxury has made to the furnishings of the table, it still maintains its character. In the opinion of Martial, the epigrammatic poet, the flesh of the hare was superior to that of every other four-footed animal; and Horace represents the hare's "wing" as being among the most highly prized of Roman luxuries. Moses, however, forbade the flesh of the hare to the Hebrews, and the Koran follows this prohibition.

In those countries of middle and southern Europe which are but thinly peopled and partially cultivated, the number of hares which are taken in the course of the year is immense, and the skins of them form an extensive branch of commerce, being exported for the hat manufacture, and also used locally as very warm articles of clothing. It is understood that the small kingdom of Bohemia alone furnishes nearly half a million of skins in the course of the year, and that Austria Proper furnishes nearly double that number; while the supply from southern Russia and western Siberia is understood to be still greater.

Though the hare is considered one of the most harmless and timid of all animals, excepting in so far as it commits depredations upon the vegetable kingdom, it has not escaped being made an object of superstitious dread; neither is it quite exempt from those foolish, and perhaps instinctive prejudices which certain individuals of the human race have against certain animals, which cannot, in the nature of things, do them any harm. It is reported of a celebrated French commander, who was an exceedingly brave man, that he always fainted at the sight of a hare. In England, when the belief in witchcraft was general, the hare was regarded as one of the most formidable animals,—the one, in short, into which old women most frequently transformed themselves, by the instrumentality of the devil, in order to wreak their vengeance on the rest of mankind. Nor has this prejudice been entirely exploded, for there are still many of the fishing villages where a hare's foot cannot be mentioned without exciting the greatest terror,—where a hare thrown into a boat would prevent that boat from going to sea; and where, if such a catastrophe were to happen as a hare to run along the beach in front of all the fishermen's huts, it would shut them up as effectually during the day as if each were guarded by a regiment of soldiers.

The hare in England comes under the head of *game*, and is protected by the game-laws the same as pheasants and partridges. It is hunted by greyhounds, and this amusement is called *coursing*, it being, next to the chase of the fox, the greatest field-sport of the English gentry. The greyhound runs by sight; but the hare is also hunted by breeds of dogs called *harriers* and *beagles*, which follow by scent, and run the hares down by a prolonged chase.

The Varying Hare, *L. variabilis*, is nearly of the size of the preceding, the legs being an inch shorter, the ears shorter, the long fur of a finer staple, and the body thicker and heavier. One of the most remarkable characteristics of this animal, and one in which it agrees with the ermine and the ptarmigan, is that it changes its color with the seasons, excepting that the tips of the ears are black at all times. In summer, the color is grayish-fawn, and in winter it is white. This change takes place in the following manner: about the middle of September, the gray feet begin to be white; this color gradually ascends the legs and thighs, and spreads under the gray in spots, which continue to increase till the end of October; but still the back continues of a gray color, while the eyebrows and ears are nearly white. From this period the change of color advances very rapidly, and by the middle of November the whole fur, with the exception of the tips of the ears, which remain black, is of a shining white. The back becomes white within eight days. During the whole of this remarkable change in the fur, no hair falls from the animal; hence it appears that the hair actually changes its color, and that there is no renewal of it. The fur retains its white color until the month of March, or even later, depending on the temperature of the atmosphere, and by the middle of May it has again a gray color. But the spring change is different from the winter, as the hair is completely shed.

This species, even during the most intense cold which occurs in those elevated and northern regions of which it is a native, keeps up the character of the race in the rapidity of its circulation and the high degree of its temperature. Even there it is as warm as one hundred and five degrees of the common thermometer, which is nearly ten degrees higher than in the human body. True to this activity of its system, the Variable hare never shows the least disposition to hybernate,

or pass into a state of torpidity, even in the severest winters; and for a great part of the year at least—its haunts have comparatively few visitors in the winter—it evinces nearly the same fertility and disposition to breed as those of its congeners which inhabit the most fertile places.

It is altogether a very interesting animal, on account of the peculiarity of its haunts and the determination, or rather the adaptation, with which it braves the utmost severity and duration of the winter storms. In the winter months, even when the storms are most severe and the snow lies longest upon the ground, these hares do not descend to the low grounds, but reside in burrows under the snow. These burrows are usually made near the root of some tuft or upland bush, by means of which a sort of chimney is kept open for the breathing of the animal, and it feeds upon the substance of the tuft. As it preserves its high temperature during the rigor of the weather, it also of course keeps up its rapid circulation, and requires a corresponding quantity of breathing and of food. Under the snow, and with their thick and white fur, these animals have no uncomfortable place of residence. Snow, till it melts, is a bad conductor of heat, and therefore the shelter of unmelted snow is really warmer than that of a hole in the earth. The white fur of the animal prevents the escape of heat from its body to the snow around it, and the warm air which it gives out in breathing speedily mounts up in the colder atmosphere, producing comparatively little effect on the breathing-chimney. In a sunny day, when the air is still and clear over the snow, the retreats of these animals can be discovered by the little column of steam which ascends from the breathing-chimney, and which forms a sort of miniature picture of the smoke from the snow-house of an Esquimaux.

This species is found principally in the north of Asia, and in Russia and the mountainous parts of central Europe, but is sometimes met with in the Alps and Pyrenees, and also in Scotland.

The Irish Hare, *L. Hibernicus*, is somewhat larger than the common hare; the head is rather shorter; the ears are even shorter than the head, while those of the English hare are fully an inch longer; the limbs are proportionally shorter; and the hinder-legs do not much exceed the fore-legs in length. The fur is also different: it is composed exclusively of the uniform soft and shorter hair which, in the common species, is mixed with the black-tipped long hairs that cause the peculiar mottled appearance of that animal; it is therefore of a uniform reddish-brown color on the back and sides. The ears are reddish-gray, blackish at the tip, with a dark line near the outer margin. The tail is nearly of the same relative length as in the common species. Notwithstanding these differences, however, some authors have suspected that this is a variety of the Varying Hare.

Among the other species of this animal are the Caspian Hare, *L. Caspicus*, which frequents the borders of that sea; the *L. Altaïcus*, found in the north of Europe and Asia; *L. borealis*, found in Sweden, and subject to an annual change of color similar to that of the Alpine hare, and the *L. canescens*, also of Sweden. M. Schimper maintains that there is a difference between the variable hares of the Alps and of Russia, and proposes to give the former the designation of *L. Alpinus*. This separation of species, however, is not established.

The *L. tolaï* resembles both the common and the nimble hare, but the head is larger and narrower than either; its color is not changeable. The *L. Thibetanus* of Thibet, greatly resembles the common hare. Beside these, two species found in Nepaul, the *L. pallipes* and *L. œmodius*, are mentioned, though not fully described, by naturalists. The *L. nigricollis* is of Java; the *L. ruficaudatus* of Bengal, Nepaul, and the Himmaleh Mountains; the *L. macrotus* of India; the *L. sinensis* of China. The *L. Syriacus* is found on Mount Lebanon; the *L. Arabicus* in the deserts of Arabia.

To this list of European and Asiatic hares we must add the following African species: The *L. Mediterraneus* of Algiers and Sicily; the Abyssinian Hare, *L. Habessinicus;* the Egyptian Hare, *L. Ægyptius; L. isabellinus* or *œthiopicus*, found in Nubia; the Rock Hare, *L. saxatilis*, found in the mountains, and the Vlakte Haas, *L. Capensis*, found in the plains, of the Cape of Good Hope. Of this region also is the Barrow Hare, *L. arenarius.*

America is even more fertile in its variety of hares than the other quarters of the globe, at least a dozen species being identified. The best known is that which goes under the name of Gray Rabbit, *L. sylvaticus;* this resembles the common European rabbit, *L. cuniculus*, in its wild

state, especially in the color. Hence the early English settlers called it a rabbit, and though it is in fact a hare, it is popularly called a rabbit to this day. It is a little smaller and more slender than the *L. cuniculus*; the fur is soft, the color in summer yellowish-brown, the tips of the hair, in some instances, though not generally, becoming white, and giving the animal a more grayish appearance, in winter. The length of the head and body is fifteen inches; weight two pounds and a half to three pounds. It lives in woods and forests, and in the thickets bordering upon cultivated grounds. Sometimes it visits the farms and plantations, and makes free with the peas, lettuces, and cabbages of the garden. It generally remains in its form by day, and makes its excursions in quest of food by night.

When first started, it runs with great swiftness, but soon seeks shelter in a stone wall, a hole in a tree, or an opening beneath the rocks. If pursued, it makes occasional doublings, and often stops and rises on its hind-legs, and listens and looks around. It has the common habit of the hares of stamping at night with its feet on the ground, when it is alarmed or when the males are fighting. It has no calling note, but sometimes utters a wild shriek when wounded or when captured. It is a prolific species, producing young three times in the season, and from five to seven at a time. It does not make burrows for itself, but sometimes, in case of pursuit, takes refuge in the burrows of other animals. Occasionally it is said to go into the retreat of a skunk; but if that personage be at home, the hare pays with his life for the intrusion.

The enemies of this timid creature are numerous; the ermine and weasel destroy it by thousands; the lynxes, the foxes, the hawks, the owls, the rattlesnake, the chicken-snake, and other serpents, prey upon it by hundreds of thousands. But man is its greatest destroyer. During the winter season the markets of the larger towns of the United States are strung with it in abundance. It is frequently taken in box-traps and in snares, and is also hunted with and without dogs.

This animal is well known in the United States, from Maine to Georgia, and westward to the Rocky Mountains: in general it is not abundant, but in certain localities it is found in great numbers.

The Northern Hare, *L. Americanus*, the *L. Virginianus* of some authors, varies in size and color, but is usually about twenty inches in length, and commonly weighs five or six pounds. In summer it is reddish-brown, a color which it retains till about November, when it gradually changes in high northern latitudes, becoming nearly pure white. In the region of New York it retains a tinge of reddish-brown. The summer dress is assumed about the month of April.

When hunted, this hare relies upon its speed and doublings for escape. It avoids open grounds, and resides among thickets, never taking to holes and burrows for refuge, like the gray rabbit. It runs easily upon the snow, being supported by its broad furred feet. It seldom ventures into cultivated grounds, but feeds on tender grasses, and the bark, leaves, and buds of small shrubs. It reposes during the day, and goes forth at night; in summer, however, it may occasionally be seen abroad in the solitary paths of the forest. Sometimes two or three may be seen together, manifesting a social and playful humor. It has the practice of thumping on the earth, when in fear or danger, as noticed in respect to other species. The period of gestation is about six weeks, and three or four litters are produced in a season. When captured, it does not, like the gray rabbit, yield without resistance to its fate, but bites and scratches vigorously.

As an article of food, this hare is not greatly prized; the fur is rather rough, and the skin, being exceedingly tender, is not easily procured. The pelt is not of much value: the hind-feet, however, are used as hair-brushes. This is decidedly a northern species, being found along the eastern portion of our continent from Hudson's Bay to Virginia. It is, however, much less abundant than the gray rabbit.

The Polar Hare, or Rekalek, *L. glacialis*.—This species is somewhat larger than the common hare of Europe, being about twenty-six inches long, and weighing from seven to twelve pounds; its color is light gray or brown in summer, and white in winter; the tips of the ears always remaining black. It is found entirely across the American continent, from Labrador north to the desolate waters beyond the reach of man. Living where all other food, vegetable and animal, is wanting, it often affords temporary subsistance to the wandering Esquimaux or the lonely adven-

turer. Captain Ross says, "There is scarcely a spot in the Arctic regions—the most destitute and sterile that can be conceived—where this animal is not to be found, and that, too, throughout the winter; nor does it seek to shelter itself from the inclemency of the weather, by burrowing in the snow, but is generally found sitting solitary under the lid of a large stone, where the snow-drift, as it passes along, seems in some measure to afford a protection from the bitterness of the blast that impels it, by collecting around and half burying the animal beneath it."

It is interesting to find that nature has so provided for this remarkable animal, that it finds a happy existence in regions abandoned to desolation by almost every other living thing. Its coat of fur is so thick as to repel the rain and exclude the cold; its eye is adapted to the dim twilight that reigns in the Arctic circle for a long portion of the year, and if offended by the glare of the sun at other seasons, it finds shelter in the shade of the dwarf trees and shrubs that abound. In summer its skin is nearly the color of the earth, and in winter it is white as the snow; and it is curious to observe that, while the summer is short and the winter long, so these changes are adjusted to the length of the seasons. The Northern Hare begins to turn white in November, and the Polar hare in September; the former resumes its brown tint in April, and the latter in June. If these adaptations are designed to protect these animals from their enemies, by rendering them less liable to observation, as no doubt they are, how interesting is this provision which screens the Polar hare from the searching gaze of the golden eagle and the snowy owl—its chief destroyers—by keeping its skin brown just so long as the earth is brown, and changing it to white as the earth itself becomes white. And this adaptation, which reaches even the timid, defenseless crouching hare, proceeds from a law as extensive as the universe!

The Marsh Hare, *L. palustris*, is somewhat smaller than the gray rabbit, the upper surface being of a yellowish brown color in summer, and growing darker in winter; beneath it is a light gray; length thirteen inches. It is slower of foot than other hares, and is protected chiefly by the miry and tangled nature of its haunts. It is confined to the maritime portions of the Southern States, and lives chiefly in marshy lands bordering on rivers and ponds, being quite numerous in some localities. It appears never to visit the plantations, nor to dwell in the uplands. It winds with facility among the rank grasses and overgrown shrubbery of the swamps, and not unfrequently takes to the water and amuses itself by gambols in that element. Its nest is made of rushes, lined with hair, and is often near the surface of the water, sometimes almost floating upon it. The young are from five to seven at a birth.

The Swamp Hare, *L. aquaticus*, is of the size of the northern hare, being about twenty inches long, and weighing seven to ten pounds. The general color is dark grayish-brown above, and white beneath. It is found in the Southwestern States. It frequents marshy or wet places, in the vicinity of rivers and ponds, though occasionally seen in the high grounds. It swims with facility, and when pursued, often escapes by taking to the water. The nests are formed of leaves and grasses, placed on mounds in the swamps. The breeding takes place twice in a season, and from four to six young ones are produced at a litter.

The Rocky Mountain Hare, *L. Townsendii*, is somewhat larger than the preceding, the color being light gray above and white beneath. It measures about twenty-two inches, and weighs six to eight pounds. The form is slender and the speed great. It is found on both sides of the Rocky Mountains. It does not change its color in winter.

The Black-tailed Hare, *L. callotis*, *L. nigricaudatus* of Bennett, resembles the preceding in its long ears, long legs, and long body, as well as in its speed, which is great. The tail is long and black; color yellowish-brown, mottled with gray above and white beneath. Its length is twenty inches. It is common in Mexico and the neighboring countries.

The Wormwood Hare, *L. Artemisia*, is a small species, even smaller than the gray rabbit, the ears being very long and conspicuous; the color a reddish-gray above and white below. Its length is twelve inches: it is found in the vicinity of Fort Walla-Walla, Washington Territory, and derives its name from frequenting the wormwood shrubberies which abound in that region.

Nuttall's Hare, *L. Nuttalii*, is of a dark brown, mixed with light buff above and yellowish-gray beneath, and is but six or seven inches long. It is found in Oregon Territory, inhabiting the thickets along streams that flow into the Columbia and Shoshonee rivers.

Bachman's Hare, *L. Bachmanii*, though smaller than the gray rabbit, greatly resembles it, and has often been deemed as of the same species. It is grayish-brown on the sides, brown above, and reddish-white beneath. The length is ten inches; it is found in Texas, New Mexico, and California; probably also in Mexico.

The Californian Hare, *L. Californicus*, is long and slender; the ears and tail long; the color above rufous brown, beneath yellowish-white. The length is twenty-two inches. In general it may be remarked that this hare, while partaking of the character of its family, is noted for its fleetness and timidity. It is found in California and the southern part of Oregon.

The Texan Hare, *L. Texianus*, is of large size, and, on account of its large ears, received from our troops in the Mexican war the descriptive title of *Jackass Rabbit*. Its color is reddish-brown above, and white beneath; the length twenty-one inches. It is swift of foot, and its flesh excellent. It is found in Texas, New Mexico, and Mexico.

There are several kinds of South American hares, but the only one of which we have definite accounts is the Tapeti, *L. Brasiliensis*, noted for its short tail, small ears, and small size. It seems to partake of the qualities both of the hare and rabbit. It is found in Brazil and the adjacent countries.



RABBIT.

The Rabbit: *Cuniculus*.—This belongs to the same family as the hare, and is by most naturalists considered as of the same genus. It has, however, many traits which distinguish it from the hare. Two prominent varieties of rabbits are known to all our readers, although no rabbit is indigenous to our continent, and it may be remarked that no species of indigenous American leporidæ has ever been reduced to domesticity. But the Domestic Rabbit of Europe, *L. domesticus*, introduced into this country by the early European settlers, is now common among us; while the Common Wild Rabbit of Europe, *L. cuniculus*, supposed to be the origin of the domestic variety, has been so often described as to make us familiar with it.

The differences between this animal and the hare are numerous and striking. In a state of nature, the rabbit is considerably less than the hare; the ears are shorter than the head; the tail is not so long as the thigh; and the whole action and motion of the animal are less vigorous and fleet than those of the hare. The general color in a state of nature is yellowish-gray; reddish on the neck and brown on the tail, with the throat and belly whitish. The ears are gray, and without any black on the tips. The rabbit is a native of warmer climates than the hare; and it is altogether an animal of different habits. The hare inhabits only where there is cover, at least to some extent, while the rabbit is met with in the open and sandy wastes. The hares never burrow in the ground, but the rabbits always do; and they live in solitude, while the

rabbits are generally gregarious. The young of the rabbit are produced naked and blind, in which respects it is unlike the hare.

Rabbits have been known from the earliest periods of history, and the first or earliest accounts which we have of them represent them as inhabiting the warm and sandy places of southern climates, especially those near the shores of the sea. We are informed by Pliny that Spain and Greece were those countries of Europe in which rabbits were first found; and it is related both by him and Varro that an entire town in Spain was overturned by the incredible number of rabbits which lodged under its foundations; and Strabo tells us that the people of the Balearic Islands, apprehensive that their country would be rendered desolate by the vast multiplication of these creatures, sent deputies to Rome, to implore military aid against this novel description of enemies. The Spaniards, in subsequent periods, thinned their numbers by means of ferrets, which they had imported from Africa. It is asserted by Spallanzani, that when the crops were wasted in Baziluzzo, one of the Lipari Islands, by an extraordinary increase of rabbits, the inhabitants had recourse to large importations of cats, which in a very short period of time entirely destroyed them.

It is supposed that the species was originally confined to Africa, and was afterward diffused over the warmer and milder parts of Europe and Asia. It has found in its introduction to America a climate congenial to its constitution, and, in consequence, has very rapidly multiplied, especially in the more tropical portions of that continent. It does not thrive in Sweden in the open air, but requires the warmth of confinement. When only five or six months old, rabbits are capable of breeding; their term of gestation is thirty or thirty-one days, and a vigorous female will produce about eight young rabbits seven times in the course of a year; so that in the course of four years her progeny, in theory, would amount to one million two hundred and seventy-four thousand eight hundred and forty individuals. But we cannot average, in the first instance, the amount of fertility at the maximum; and, secondly, as we have observed in the history of the hare, the race is obnoxious to the attacks of men, and of various predaceous animals.

If the dam does not find a hole suited to her purpose previously to her bringing forth, she digs one, not in a straight line, but in a zig-zag direction, enlarging the bottom of it every way, and pulling from her own body a quantity of hair, with which she makes a warm and comfortable bed for her young. The female during the two first days seldom if ever quits her young, unless when pressed by hunger, at which time she eats with surprising quickness, and returns immediately. When she ventures abroad, she covers up the hole very carefully, scarcely leaving any perceptible mark of it, and conceals her charge from the male lest he should devour them. She continues these attentions for about a month, when the young are able to provide for themselves. She seeks to avoid all damp places, and prefers a light, sandy, dry soil to any other.

The ordinary term of a rabbit's existence is from seven to ten years. On a dead level it finds it difficult to make its burrow, as, in such a situation, the mold must be thrown upward to the surface; whereas, on the side of an eminence, the declivity affords a ready fall for the earth. As the rabbits on the island of Sor, near Senegal, do not burrow, we are tempted to suspect that the digging of holes for themselves in colder climates is an acquired art, prompted by circumstances. This conjecture will appear still more probable when we reflect that domestic rabbits never give themselves the trouble of digging, and that when a warren is attempted to be stocked with a domestic breed, they and their offspring remain on the surface, and never begin to make holes for their protection until they have endured many hardships and passed through many generations.

The wild rabbit we have been describing, called by the French *Lapin de Garenne*, is found in southern and central Europe, preferring elevated and rocky places, and being uniformly brown on the upper parts, with reddish spots behind the ears, and the lower parts whitish. The domestic kinds, agreeably to a law which applies to many other animals, are of various colors. In the English preserves these wild rabbits often multiply to a great extent, and sometimes they may be seen by hundreds sporting among the thickets, which are deemed their appropriate homes. Many of them often burrow near each other, such a collection being called a *warren*. Poachers take

numbers of them by spreading nets near the mouths of the burrows and sending in ferrets to drive the animals out. The nests of the females, as we have stated, are made of fur from her own body, and dried leaves.

The breeding of tame rabbits, with a view to the supplying of markets, is carried on in various parts of Europe upon a large scale. In France, the subject is treated as a branch of political economy, and in this point of view the prolificness of the rabbit has been the theme of special notice. A noted author, M. Despouys, in a pamphlet recently issued, sought to demonstrate that an investment of five hundred francs may, by proper management, be made to yield an annual income of twenty thousand francs.* The number of rabbits furnished to the Paris markets amounts annually to several hundreds of thousands.

Of the domestic rabbit there are several breeds, one of which, the *Lopeared Rabbit*,—though it seems really to be a deformity,—is so much esteemed that one will often sell in Europe for a hundred dollars; a hundred and fifty dollars has indeed been offered for a favorite specimen. There has been some dispute as to the origin of the domestic rabbits, but as these soon become wild when left at liberty, and finally return to the manners and appearance of the wild rabbits, there is no difficulty in coming to the conclusion that the latter are in fact the progenitors of the domestic breeds.

Besides these varieties of the *Common Rabbit*, there are several kinds which claim to be distinct species: such are the Sinai Rabbit, *L. Sinaïcus*, found in Arabia Petrea, near Mount Sinai; the Algerine Rabbit; the Big-tailed Rabbit, *L. crassicaudatus*, of the Cape of Good Hope, and the *L. brachyurus*, found in Japan. Gervais also describes a species which is called the Rough Rabbit, *L. hispidus*, whose fur is rough to the touch; it is spotted with black on a ground of brown above, growing paler and passing into white below. Some peculiarities of structure have led to the arrangement of this species as a sub-genus, under the title *Carpolagus*.

Genus LAGOMYS: *Lagomys*.—These animals, of which there are several species, are smaller than the hares and rabbits, and have some resemblance to the Guinea-pig. They live in burrows, feed on vegetable substances, lay up provisions for the winter, and have a strong voice resembling that of the quail. The term *lagomys* signifies *hare-mouse*, and is appropriate to the curious little animals which it designates. They constitute the sub-family of *Lagomina*, of some authors, having the muzzle acute, the ears short and somewhat rounded, the soles of the feet hairy, the claws falcular, and no tail.

The Pika, or Calling Hare, the Alpine Lagomys, or Rat Hare, *L. pusillus*, is the *Ground Hare* of the Russians, and the *Barking Mouse* of the Tartars; it has the head longer than usual with hares, and thickly covered with fur, even to the tip of the nose; numerous hairs in the whiskers; ears not long but rounded; legs very short; soles furred beneath: its whole coat very soft, long, and smooth, with a thick, long, fine down beneath of a brownish lead-color; the hairs of the same color, toward the ends of a light gray, and tipt with black; the lower part of the body

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* M. Bouscaren, of the Society of Agriculture of l'Herault, has treated the subject more rationally and with a minuteness of detail which enters alike into the moral as well as the physical well-being of the rabbit community. The following is the result of his calculations:

Twenty-four females may furnish at five births, annually, of six each, to speak within bounds, 720, which, at one franc and a quarter each, will yield		900 francs.
From this deduct rent and care of the premises	100	
Care of the rabbits, making a suitable allowance for the manure	100	
Rent of twenty ares (one are being 120 square yards) of land for raising barley, vetches, beets, &c	50	
One thousand pounds oil-cake	50	
Grape seeds and other seeds	50	
Miscellaneous expenses	50	400
Net profits		500 francs.

The Penny Cyclopedia says: "The fertility of the rabbit may be imagined when it is remembered that it will begin to breed at the age of six months, and produce several broods in a year, generally from five to seven or eight at a time." Pennant says: "Rabbits will breed seven times a year, and bring eight young ones each time. On a supposition that this happens regularly during four years, their numbers will amount to one million two hundred and seventy-four thousand eight hundred and forty." We have intimated, however, that this is merely theoretical.



THE CALLING HARE.

hoary; on the sides the fur is yellowish; length about six inches; weight from three and a quarter to four and a half ounces; in winter scarcely two and a half ounces.

The Calling Hares delight in the most sunny valleys and hills, where the herbage is plentiful and delicate. They choose these localities when in the vicinity of a wood, which will afford them a ready refuge in case of danger or alarm. Their burrows are usually formed under bushes or tangled vegetation of some sort or other. During the day they are generally concealed in these subterranean retreats; but they come abroad during the night, at which time they are understood to see as well as during the day. In the morning and the evening, and at intervals during the night, they call to each other with a cry which has been compared to that of the quail, and which, notwithstanding the small size of the animal, may be heard at the distance of a mile. It is on this account that the epithet "calling" has been added to their name. The uttering of this cry seems to be a matter of considerable exertion to them; for it is attended with a motion of the neck and head very similar to that of the dog when he barks. When the weather is fine they are in general silent during the day, but when it lowers, or is tempestuous, they become noisy, and are, like many other animals, a sort of natural indicators of the weather. Both the male and female utter this cry, though the latter is silent for some time after giving birth to her young.

In the long winters of the country which they inhabit, they form galleries under the snow, by which they reach those shrubs on the bark of which they feed, without at all appearing on the surface. In summer they eat grass and succulent leaves; but they are often reduced to great extremities in the height of summer, when the moisture is dried up and the plants withered from the ground. In such cases they are sometimes compelled to feed on the droppings of the larger herbaceous mammalia; and they are equally pinched for water, of which they drink freely when it is to be had.

These are very cleanly as well as very delicate little creatures, and keep their burrows very neat. They are prolific, the females producing about six on the average. The time of gestation has not been ascertained; but, from the analogy of the whole race, it is presumed to be very short. The young are produced with the eyes closed, and without any fur on their bodies; but the fur begins to appear about the eighth day, and the growth is very rapid. In their dispositions, these little creatures are the gentlest of all imaginable animals, and though, when in a state of nature, they are very timid, they are susceptible to kind usage, and when tenderly treated become very tame.

When awake, the sitting position is nearly spherical, and the animal about fills the hollow of the hand; but in sleeping, the body is more stretched out. Like hares, they are leaping animals, but the shortness of the hind-legs renders the leap rather slow and awkward; and they are by no means swift upon the ground.

These curious animals inhabit the southeastern parts of Russia, and are found about all the ridges spreading from the Ural mountains to the south, along the Irtish, and in the western parts of the Altai mountains, but nowhere in the East beyond the Obi.

The Alpine Lagomys, or Alpine Pika, *L. Alpinus*, called Ladajac by the Siberians, is found in the Altai mountains, and in Kamtschatka and Siberia. Its general color is reddish-yellow, interspersed with much longer hairs of a black color. The part round the mouth is ash-color, and the under parts of the legs and the ears brown, the latter being rounded in their outlines. The length is only about nine inches and a half.

This species is very abundant in some parts of Siberia, where it is well known to the hunters. It is found on the slopes of the steepest mountains, and even on the most inaccessible rocks: but in all situations they prefer the humid copses, in which, in rocky and mountainous places especially, they find abundance of herbage during the whole of the summer season. They are, strictly speaking, ground animals, and live indiscriminately in burrows excavated by themselves, in holes of the rocks, and in the hollows of decayed trees. They are not gregarious, but are found singly, or in pairs, or in families, according to the season. About the middle of August they begin to collect with great diligence and industry their store of provisions for the winter. This consists of the seeds of plants, of leaves, and of grasses, and they make their magazines in the earth, in the holes of rocks, or in the hollows of trees. These stores are not collected by each animal for itself; for, according to the number that may be in any particular locality, they unite in the labor of collecting the winter store; and it is understood that so true does the collecting instinct remain while the store lasts, that none of those who bore a part in the labor of collecting are ever excluded from their share of the magazine, neither can strangers invade it, how severely soever necessity may pinch them. These magazines are often of very considerable magnitude, considering the small size of the animals. They frequently bear a considerable resemblance to a hay-rick, seven or eight feet high, and about the same in diameter; and when they are of this size, the animals form a subterranean passage from their own dwellings to the store, by which they can find their way when the whole is buried under the snow. These animals do not, as we have hinted, commit any depredations upon the stores of each other, but they often do not come off so well at the hands of the Siberian hunters, who, when provender for their horses fails, frequently plunder these industrious little creatures.

Pallas examined, with that attention which he was in the habit of paying to all subjects connected with the economy of nature, the stores collected against the season of want by these provident animals. He found that they displayed wonderful animal sagacity, both in the plants which they selected and in the time at which they cut them down. There were no thorny plants or ligneous stems; and the whole appeared to have been cut down at that stage of their growth at which grasses are understood to make the best hay. If grasses or other plants which are intended for this purpose are cut down too early, they are full of sap, which is not only tasteless, but it ferments and rots the whole when gathered into a heap. On the other hand, if the stems of annual plants stand till the grand labor of the year is over by the ripening of the seeds, the stems which are left are sapless, and afford but little nourishment. The pikas avoid both these extremes, and cut down their winter store when the juice of the stem has acquired its greatest maturity and sweetness. These harmless little animals, though exposed to the peril of famine by having their stores plundered by the hunters, have still other enemies beside the human race. The weasel tribe, which are very numerous in that part of the world, seek the abodes of the pikas with much assiduity, and kill them in great numbers; and, as is the case with many of the warm-blooded animals in those northern countries, they are much infested and tormented with the larvæ of insects.

The Gray Pika, or Ogotona, *L. Ogotona*, is of a pale gray, and is found in Mongol Tartary, especially in the Desert of Gobi, and in the regions around Lake Baikal. It is an animal of the

desert, or at all events, of stony places and sandy situations. The burrows are dry, shaped after the fashion of those of rabbits, but always with two entrances, and with these near heaps of stones; and in the bottom of these burrows they form for themselves comfortable couches of leaves and other vegetable matters. They are, to a very considerable extent, nocturnal animals, and not only so, but in their nightly excursions they seek the most lonely places. The mountain gullies, and the narrow strips of land by the banks of rivers, where they are least likely to meet with enemies, are their chosen places, and, secure in these, they nibble the fresh bark and buds of the shrubs. In summer, they live upon the scanty vegetation which the arid wastes produce. As is the case with the former species, they collect stores against the winter, and the people of Siberia look upon them as a kind of "weather-wisers," always concluding that the storm is at hand when those little animals collect their stores with more than ordinary diligence. They do not collect their stores into one great magazine, as is the case with the former species, but into a number of heaps of a hemispherical shape, and about a foot in diameter each, which may be seen near their burrows from about the month of September through the winter; but as the spring approaches they disappear, and by the time that the snow is off the ground they are nearly gone.

They are very quick and active in their motions; but they are so timid that they are not easily tamed, and in a state of nature they are so small and feeble that they are exposed to many enemies. During the day they are the victims of birds of prey, and in the night, the time when in general they are most abroad, they are captured by lynxes, martens, and various others of the weasel tribe.

The Northern Lagomys, *L. Hyperboreus*, is less than five inches long, and is of a grayish brown color; it is found at the northeastern extremity of Asia. The Russet Lagomys, or Reddish Sulgan, *L. rufescens*, inhabits the rocky hills of Cabul; the Indian Sulgan, *L. Roylii*, is found in the Himmalayan Mountains; the Red-Shouldered Sulgan, *L. Nepalensis*, is a native of Nepaul.

In our country there is a single species of Lagomys, the Little Chief Hare, *L. princeps*. This inhabits the Rocky Mountains from latitude 52° to 60°. N. It frequents heaps of stones, in the interstices of which it makes its way with facility. At sunset, it often mounts a stone and calls its mate by a shrill whistle; when surprised by man, it utters a similar cry. It feeds on vegetables; its other habits are little known.



THE COMMON EUROPEAN SQUIRREL.

THE SCIURIDÆ.

This family, named from *Sciurus*, a Squirrel, includes not only the diversified and interesting tribe of *Squirrels*, but the *Marmots* and *Spermophiles*, animals having affinities with them, but in some cases, differing from them in certain important characteristics.

Genus PTEROMYS: *Pteromys*, or *Flying-Marmots*.—The term *Pteromys* is derived from the

Greek *pteron*, wing, and *mus*, a mouse, and is used to designate certain animals called *Taguans*, and known as *Flying-Squirrels*, but which might very properly be called *Flying-Marmots*. They are found in Asia and the adjacent isles, the flying-squirrels similar to those common in America, called *Assapans*, being of a different genus, *Sciuropterus*, which will be hereafter noticed.

The form of the head in the genus Pteromys is like that of the marmots, but the ears are smaller, the body is more slender, and the tail is long and plume-like. A thin membrane, covered with fur, extends from the fore to the hind-legs on each side, this being spread out and serving as a kind of parachute to support them in leaping from tree to tree, by which means they perform a kind of flight. They are very lively, running about on the trees with great vivacity, in this respect resembling the squirrels. Most of them are distinguished by the brilliancy of their hues. Their size is that of the marmots, and *flying-marmots* would in fact be their appropriate title, the term *flying-squirrel* being more descriptive of the smaller species.

The Great Flying-Squirrel, *P. sagitta*, is the *Flying-Cat* of Nieuhoff; the *Felis volans* of Brisson, and the *Taguan* or *Grand Ecureuil Volant* of Buffon. It has a small rounded head; cloven upper lip; small blunt ears; two small warts at the outmost corner of each eye, with hairs growing out of them; neck short; four toes on the fore-feet, and instead of a thumb, a slender bone, two and a half inches long, lodged under the lateral membrane, serving to stretch it out; thence to the hind-legs extends the membrane, which is broad, and a continuation of the skin of the sides and belly; the membrane extends along the fore-legs, and stretches out near the joint in a winged form; five toes on the hind-feet, and on all the toes sharp, compressed, bent claws; tail covered with long hairs disposed horizontally; color of the head, body, and tail, a bright bay, in some parts inclining to orange; breast and belly of a yellowish-white; length, from nose to tail, eighteen inches; tail, fifteen inches. This species inhabits Java and others of the Indian Islands. It leaps from tree to tree as if it flew; and it is said will catch hold of the boughs with its tail.

The Brilliant Pteromys, *P. nitidus*, is of a deep chestnut color above and bright red below; the body is fifteen inches long, and the tail seventeen inches. It is found in Java and Borneo. The *P. genilabris*, *P. elegans*, and *P. lepidus*, resemble the *P. sagitta*, and are found in Java. The *P. petaurista* is found in the Moluccas and Philippines; the *P. inornatus* in Cashmere. All these animals appear to repose in holes in the trees during the day, and at night to go forth and feed on fruits and vegetables. Some of them hibernate, but their habits are not fully known, and there are doubtless several species not yet verified.

Genus SCIUROPTERUS: *Sciuropterus.*—This includes the Assapans, or true *Flying-Squirrels*, which have a form resembling the common squirrels, with a lateral membrane similar to that of the *Pteromys*. By means of this they make enormous leaps, sometimes of fifty yards or more, from tree to tree, usually at first descending, and then rising and alighting, in the manner of birds about to terminate their flight. They are easily distinguished from the *Pteromys* by the naturalist: the eyes are remarkably full; the cranium is formed like that of the squirrels, and not like that of the marmots; the side membranes terminate near the wrist with a rounded lobe, while those of the pteromys end in a projecting point; and finally, the molar teeth resemble those of the squirrels more than those of the pteromys, having the sinuosities of the enamel much more complicated. Species are found in the temperate parts of Europe, Asia, and America, but not in the Asiatic isles, the chief seat of the flying-marmots.

The Minene, or European Flying-Squirrel, *S. Sibiricus*, called by some naturalists *Sciuropterus Polatouche*, is the *Sciurus volans* of Linnæus; the *Polatucha* and *Letaga* of the Russians; *Polatouche* of the French; *König der Grauwerke*, or *King of the Squirrels*, of the Germans. The eyes are prominent, the lids being edged with black; the membranes extend to the base of the fore-feet, forming a large wing-like expansion on each side; tail full and rounded at the extremity; body above of a fine gray color; beneath, pure white; total length about ten inches, of which the tail, measured to the end of the hair, is somewhat more than five. It is a native of Finland, Lapland, the Russian dominions from Livonia to the river Kolyma, or Kowyona, in the north-east of Siberia. This species haunts the woody, mountainous country, feeding on the buds and fruit of the birch-trees, and on the cones of the fir tribe. It is a solitary animal, and does



FLYING-SQUIRREL.

not affect the company of others of its own kind, nor does it retire in the winter, at which season it wanders about. Its dwelling is in the hollows of trees, and its nest is generally made of moss from the birch. It raises the tail when at rest, but when it takes its flying leaps, extends that member.

This is the only flying-squirrel known in Europe, but in Northern Asia, and also as far south as Northern India and Nepaul, there are other species, among which are mentioned the *S. noble*, the *S. frangé*, &c.

In America there are several species, among which is the *S. volucella*, or Common Flying-Squirrel, familiar to the inhabitants of the United States, and certainly one of the most curious, soft, gentle, and beautiful of living things. The head is short and rounded, nose blunt, eyes prominent, ears nearly naked; body and head four and a half inches long; tail, with the fur, four and three-quarters inches; spread of the fore-legs, six inches, and the hind-legs, seven. The fur is soft and silky, the tail flat and distichous, the color brownish-ash, touched with cream-color above, and white beneath.

These squirrels are very numerous, but being chiefly nocturnal in their habits, they are not so frequently seen as some others. They are found in all the Atlantic States, in Canada, Texas, and Mexico. They inhabit the woods, making their nests in the vacant hollows of trees, and sometimes in crevices in the eaves and roofs of houses; they feed on nuts and seeds, and occasionally, it is said, on flesh, if it falls in their way. In the north they produce young once a year, at the south twice, three to six at a time. The period of gestation is about a month. If one of the young is taken from the nest, the mother on finding it lays it on its back, when it takes her round the neck with its fore-legs, while she grasps its thigh in her mouth, and thus she proceeds rapidly to deposit it again in its nest. These animals, though shy and solitary, readily become tamed, and are exceedingly pleasant little pets.

During the day, these squirrels remain in their nests in repose, the glare of the sun being painful to their eyes, which stand out like those of the owl. But at evening they issue from their hiding-places, and display the most wonderful activity. They are social creatures, and large numbers usually congregate in the same locality. An unobservant person might pass through their haunts for years, in the daytime, and not dream of their existence; but if he will pause here at nightfall, he will be struck with wonder and admiration at the scene they present. They come out, sometimes by dozens, from the tall trees, and commence flying in all directions. They start from

an elevated position—usually the very top of a tree—stretch out their legs, thus expanding their flying-membranes, spread their tails, and launch forth with a spring or jump, usually taking aim at the trunk of some tree at the distance of forty or fifty yards. They glide swift as an arrow, gradually descending, until, seeming to be near the earth, they suddenly turn upwards, and alight on the body of the tree to which their flight was directed. Some of them may be seen flying back to the same tree from which they started, again and again repeating this operation, and evidently enjoying the performance as a matter of sport. Others having alighted on one tree, ascend to its top and glide to another; again mounting and starting, and thus proceeding in a direct line, they will travel a quarter of a mile in an exceedingly short space of time.

Such is the scene occurring every night, during the warm season, in a thousand places in our American forests. We—animals of the daylight—are apt to fancy that the whole world of animated nature sympathizes with us, and that all go to their repose as we do, in the hours of darkness, forgetting that to innumerable species the day is the time of darkness and sleep, and night the season of light and activity and enjoyment. It is in the night that whole tribes of animals, foxes, weasels, martens, skunks, lynxes, wild-cats, cougars,—to say nothing of owls, goat-suckers, and the multitudinous race of moths,—wake from their slumber and go joyously forth on their various adventures, whether of love, feast, or frolic. Whoever would comprehend the whole field of nature, must not be content to look merely upon the surface, and that by daylight: he must reflect upon what passes beyond the reach of sight, whether in the shadows of night, or in the recesses of the earth; in the soil and the sod; in caves and rocks, and in the sea.

The Oregon Flying-Squirrel, *Pteromys Oregonensis*, is somewhat larger than the preceding, the length of the body being nearly seven inches. Its general color is brown above and white beneath. Its habits are little known; but they are, doubtless, very similar to those of the preceding species. It is found on the Rocky Mountains, in the region of the Columbia River, as well as west and north of that locality.

The Severn River Flying-Squirrel, *Pteromys Sabrinus*, is one-third larger than the *P. volucella*, the body being eight inches in length; its color above is a dull, yellowish gray, with irregular patches of a darker shade, and white, with a tinge of buff, beneath. On the whole, it bears a considerable resemblance to the European flying-squirrel. It is common at Quebec and the vicinity, and along the shores of Lake Huron. A curious instance is recorded in which a brood of young squirrels of this species were kept in confinement for some months. The mother suckled her young ones by clinging with her fore-feet to the perch of the cage, letting her body hang down, while the little ones stood on their hind-legs and took their meal from her breast. This brood was procured by some laborers, who, in clearing a wood by setting it on fire, saw the mother carry them, one by one, from the burning trees, to a place of safety. When they took her, she was found to be singed. This good and devoted mother had three of her young ones killed by the rats, which got into the cage at night; and she herself had one of her thighs broken, and a part of her flesh eaten from her body to the bone; yet she was found in the morning clinging to her little ones and trying to nurse them!

The Rocky Mountain Flying-Squirrel, *Pteromys Alpinus*, is still larger than the preceding, the body being eight and a half inches long; the general color is yellowish-brown, on the back; on the throat and belly, a grayish-white. It is found in the thick pine woods of the Rocky Mountains, about latitude 42°. It is very shy, and seldom ventures from its retreat, except at night. It seems to be of a heavier mould than the other species, and its flying membrane is also of comparatively less size; whence, it is inferred, that its power of supporting itself, in gliding through the air, is inferior to that of some other kinds.



MARMOTS.

Genus MARMOT: *Arctomys.*—Marmot is the popular name of the best-known European species of this genus, and *Arctomys* means *bear-rat*, a *rat having a body resembling the bear*, which is an excellent description of these animals. Like the rest of the order, they are without canine teeth, and in the sharpness of the incisors of the lower jaw, they bear some resemblance to the great family of rats and mice, though, in other respects, they bear a stronger resemblance to the squirrels; their external forms, and also their manners, are, however, peculiar. They have five grinders on each side in the upper jaw, and four in the under, the summits of which have sharp tubercles, so that they seem capable of subsisting on insects, and even on the flesh of larger animals, as well as on vegetables. Their bodies are thick and clumsy, their legs short and thick, their head flat, their ears short and blunted, and their tail short and apparently incapable of motion.

At all seasons they are ground animals, and spend the whole of their time, except what is taken up in feeding, in their burrows, which they dig with great ease and rapidity, and to a considerable depth, always sloping downward, so that the dwelling may be beyond the reach of the intense cold of the winter, and yet so contrived as to be in no danger of filling with water during the rains or the melting of the snow.

Some of them are animals of considerable size, not less than the cat, but differently formed. Though easily taken, as their progressive motion is slow, and it is not very difficult to dig them out of their burrows, they are of little value to mankind as game. In autumn, when they are fat, they are sometimes eaten, but they are not very palatable to those who have a choice of food.

The European or Alpine Marmot, *A. marmotta*—the *Mus marmotta* of Linnæus—inhabits, as its name implies, the Alps, and some of the other lofty mountains of Europe; but it is not found even in the most mountainous parts of the British Islands. It is about sixteen inches long from the nose to the root of the tail; its color is subject to some variation; but the prevailing hue on the upper part is dark gray, with the tip of the tail black. The feet are whitish, the part surrounding the muzzle whitish-gray, and the under part of the body bright brownish-red. Its large head, its squat, clumsy body, and its short thick legs, give it what one would be apt to consider an expression of stupidity; but in the case of no animal is the external appearance more at variance with the facts.

In a state of nature it conducts the making of its burrow with greater neatness, and keeps it in better order than most of the burrowing rodentia, and its domestic economy is scarcely inferior to that of the beaver itself. In fact, though the hut of the beaver is a structure reared, and the



CATCHING A MARMOT IN SWITZERLAND.

burrow of the marmot is excavated, there is an ingenuity in the one burrow which is not found in the other. It always consists of two galleries, the one of which contains the dwelling and the entrance to the dwelling; and the other, which meets this, but has a greater inclination and opens further down the slope, and at a lateral distance, is a sewer or drain, by means of which the inhabited portion is always kept dry and comfortable. The nest consists of a great quantity of dried grass and moss, and is made sufficiently large for holding a considerable number of the animals, which keep one another warm during the inclement season, which is often very severe in the elevated places which these creatures inhabit.

All the society which inhabit the same burrow work in concert, both in preparing it and stocking it with those provisions which are necessary before they pass into a dormant state for the winter, and after they awake in the spring, and before the fields are fit for their support. It is very generally said, that in carrying home their stores, one of the society allows the others, and even invites them, to use his body as a sort of sledge. He turns on his back, and is loaded with as much of the dry grass, or moss, or other necessary of a marmot's life, as he can hold together with his paws. When he is thus loaded, his comrades seize him by the tail and pull him along with his load, he contriving to keep steadily on his back all the time. As those which act as horses to this singular sledge get tired, they are relieved by others; and if "Sledge" himself gets exhausted, another is loaded, and so on, until the load is safely conveyed to the burrow.

The food of these creatures consists of roots, and vegetables, and occasionally of insects. From five to a dozen lodge in one chamber. They retire for hibernation early in October, stopping up the mouths of their burrows with earth. Here they lie, in a dosing, but not utterly unconscious



THE EUROPEAN MARMOT.

state, until the warm sun of April calls them to activity. They are playful in disposition, but when angry, or before a coming storm, they utter a shrill, piercing whistle.

The marmot of the Alps is easily tamed; and, in a domestic state, it is a very docile, gentle, and intelligent creature, and may be taught many little tricks, all of which are amusing, and none of them offensive. It is a common pet, and especially with the young Savoyards, who often travel to different parts of Europe, picking up a comfortable living by showing off the humors of one of these creatures and singing their native songs. On all the great thoroughfares of the cities of continental Europe—Paris, Vienna, Berlin—these Swiss showmen may be seen, and appear to be always welcome to the populace. Some of them acquire money enough to return to their mountain homes and live in rustic comfort for the rest of their days.

This species are not so productive as some of the other rodentia, there being only one litter in the year, each litter consisting, in general, of three or four; but the animals are subject to fewer casualties than one would suppose, in the cold places which they inhabit, and where the keen eyes of eagles and vultures and other powerful birds of prey may be supposed to be frequently upon them. They are very vigilant; and it is understood that when they are engaged in their labors, they always have a sentinel posted on some rock or other eminence, who keeps careful watch, gives notice of danger before it is near, and has himself some little place into which he can retire and remain till the danger is over.

The Polish Marmot, or Bobac, *A. bobac*, is nearly of the same size with the former, but is different in color. The general hue is yellowish-gray, mottled with brownish-black, with the under part of the body yellowish-russet, and the throat and tail reddish. A portion round the eyes is brown; and that round the muzzle is silver gray. It is to be remarked, however, that there is a variety which is nearly black. Many of the skins come to the European markets from Odessa.

The native localities of this species are further to the north than those of the marmot of the Alps; for it is found from Poland to Kamtschatka, and thence to the south as far as Thibet. It does not inhabit such elevated places, however, as the Alpine marmot; and, therefore, though it is found in higher latitudes, it does not follow that it is in a colder climate. It is also careful in selecting the exposure of the situation in which it forms its burrow, and also in the kind of soil in which it is made. It always builds or burrows in a bank sloping to the south, and in dry soil. The burrow is deep, and lodges a colony of from twenty to fifty individuals. The quantity of dried grass introduced into these social burrows is very great; and they are said to be very industrious in their labors.



WOODCHUCKS.

The Long-tailed Marmot, *A. caudatus*, says Gervais, is found in Asia, in the valley of the Gombour; Jacquemont met with it seventeen thousand feet above the level of the sea. It makes its burrows, which usually open among the rocks, in countries well stocked with vegetable products. Here it accumulates great quantities of dried herbage, which serves it for food during its winter confinement, the first and latter part of which it is not probably dormant. When it comes forth, in the spring, it is observed to be very lean.

The Maryland Marmot, or Woodchuck, has had the usual honor bestowed on the notorious—that of receiving various popular names, to which may be added, in this case, an equal variety of scientific names. In Canada, it is called *Ground Hog*, *Siffleur*, and sometimes *Marmot;* in Hudson's Bay, *Thick-wood Badger; Tarbagan*, by the Russians of Russian America; *Weenusk*, by the Crees, and *Kath-hillœ-kooay*, by the Chippeways. Linnæus called it *Mus Monax;* Buffon, *Marmotte de Canada;* Pennant, *Quebec Marmot;* Pallas, *Mus Empetra;* Goodman, Richardson, and others, *Arctomys Empetra*, which is its present accepted scientific designation. *Woodchuck* is the popular title throughout the United States.

Despite this multiplicity of titles, this animal is not particularly interesting in its character. It resembles the Alpine Marmot, though it is somewhat larger. It is, however, destitute of the amusing qualities of that species; it is not easily tamed, and, under all circumstances, is a rather surly creature. The body is thick and squat, and the legs so short that the belly seems to graze the ground. The size varies from sixteen to twenty inches, eighteen being the average; the tail is four inches. The color also differs in different specimens; the body being generally brownish-gray above, and reddish-brown below. The head, tail, and feet are blackish-brown; the nose and cheeks ashy-brown. They are fond of sitting erect on their haunches, letting their fore-feet hang loosely down. They maintain an erect position in feeding, bending the head and neck forward and sideways. They remain the greater part of the day asleep in their burrows, occasionally, however, coming out and looking around. In the evening, they go forth and feed on grass of different kinds, fruits, and vegetables. In New England, they are common among the cultivated grounds, and do much damage in the clover-fields, not only eating the grass, but treading it down; they often make great havoc among the pumpkins and the Indian corn when it is in the milk. From three to eight young are produced at a time; they advance rapidly, and in three weeks may be seen playing around the burrows.

The woodchuck is not often found very far from his burrow in the daytime. When thus surprised, he runs very fast, and if not seriously frightened, stops, and perhaps squats on the ground,

looking slyly around to see if he is noticed. In case of extremity, he takes refuge in a stone wall, or the crevice of a rock, and on being closely approached, he utters a kind of gurgling sound, mingled with chattering; at other times he has a shrill, whistle-like note, whence the French-Canadian name of *Siffleur*, whistler. In defending himself, he bites severely, and makes desperate battle with a dog, often with such success as to escape. His walk is plantigrade, but he occasionally climbs trees and bushes to the height of a few feet, and sometimes takes a nap in the sun, while reclining on one of the branches. He cleans and combs his face, sitting on his hind-legs, in the manner of a squirrel, and licks down and smoothes his fur in the manner of a cat. His hide is loose and tough, and was formerly much in vogue for whip-lashes; it is still occasionally used for that purpose. The fur is of no value. The flesh is flabby, and, though of a rank flavor, when cooked like roast-pig it can be eaten, if one has a vigorous appetite. In summer it is very fat.

This species becomes torpid about the latter part of October; they are solitary in their habits, and do not congregate in societies, like the other marmots, beyond the members of one family. It is believed that they eat nothing during the period of their hibernation. Their burrows are usually on the slope of a hill, frequently near the root of a tree, sometimes beneath rocks, and often in stone walls. They extend from twenty to thirty feet from the openings, descending obliquely at first, four or five feet, and then gradually rising to a large, round chamber, which is used as a sleeping-place for the family; here, also, the female produces and rears her young. The farmers of New England take them sometimes by pouring water in and drowning them out; frequently they are shot with rifles; more frequently still they are caught in steel-traps, set at the mouths of their burrows, these being sprinkled over with sand or light grass. One farmer in Litchfield county, Connecticut, told me that he caught sixty-four on his own grounds in a single season.

We have read an interesting account of a woodchuck that was kept in confinement for two years. At first, it was wild and ill-natured, keeping itself concealed during the day, but making attempts to escape at night. At last, it became reconciled to its situation, and lived in the kitchen on good terms with the cook, the cat, and the dog. It now occupied a box with a straw bed. When winter approached, though the box was in a warm corner of the kitchen, the animal arranged its bed carefully, rolled itself into a ball with its nose buried in its abdomen, and became completely torpid. Thus it remained for six weeks. It was then taken out and rolled upon the carpet, not showing the least sign of animation. It was laid by the fire, and in about half an hour it slowly raised its head, looked round, and attempted to find its house. It was restored to its bed, where it remained in its strange repose till spring.

What a wonderful provision of nature is this for those quadrupeds that inhabit a cold region, and which, living on green vegetables and juicy fruits, would perish, where the earth is bound in ice and snow for half the year, if compelled to obtain their daily meal! How wise, how all-knowing is the Author of Nature, who can conceive the design of sustaining animal life without food for half a year; how wonderful His skill who can so adapt means to ends as to accomplish this miracle, and make it a familiar example in a great variety of species!

The woodchuck is extensively distributed, being found in the Canadas, and thence south to the Carolinas, and west as far as the Rocky Mountains. In some places it is scarce, in others, it is very abundant.

The Hoary Marmot, *A. pruinosus*, is also sometimes called *Ground-Hog* and *Whistler*, the latter, indeed, seeming to be its proper descriptive title. The Crees name it *Quisquis-qui-po*, and the Chippeways *Deh-ie*. It somewhat resembles both the Alpine and Maryland marmots; its length is eighteen to twenty inches; its hair, long and dense, is hoary on the breast and shoulders, the hinder parts being a dull reddish-brown; the tail, which is bushy, is blackish-brown. It inhabits the Rocky Mountains, from latitude 45° to 62°, and probably farther north and south, as well as east and west. It is not found in the lower country. It burrows in sandy soil, generally in the sides of grassy hills, and may be frequently seen cutting hay in the winter, but whether for food or for lining its burrows is not known. While a company of them are thus occupied, they have a sentinel on the look-out upon an eminence, who gives the alarm in case of the approach of

danger, by a shrill whistle, which may be heard at a great distance. This signal of alarm is repeated from one to another as far as their habitations extend. They feed on roots and herbs; the female has two or three young at a time, and sits on her hind-legs to nurse her progeny. They remain in their burrows in winter.

The Indians catch these animals by setting traps at their burrows, and esteem their flesh as good eating. By sewing a number of their skins together, they make good blankets. A specimen of this kind of marmot was lately in the Zoological Gardens of London.

Lewis's Marmot, *A. Lewisii*.—This animal is of the size of the gray rabbit; the color is reddish-brown, the feet being barred with white; the tip of the tail is white. The length of the body is sixteen inches; the tail, with the hair, five inches. The habits of this species are little known; they, however, burrow in the earth, subsist on grain and grass, and sometimes ascend the trunks of trees for a short distance. They are found in Oregon.

Genus SPERMOPHILE: *Spermophilus*.—This term is derived from the Greek *sperma*, seed, and *phileo*, to love, and therefore means that these are *seed-lovers*, or *feeders upon grain*. They



THE SOUSLIK.

resemble the squirrels somewhat, but more the marmots, being, like them, burrowing animals, and at the same time distinguished from them by having cheek-pouches. Hence they may be called *Cheek-pouched Marmots*. There are several species in Europe, Asia, and North America.

The Souslik, *S. citillus*, is about eight inches long, and the tail one-third as long; its color is grayish-brown, marked with white rounded spots above; the color beneath is white. It lives solitary in burrows in the earth; feeds on grain and seeds, and frequently causes great destruction to the crops. It is found in Bohemia, Hungary, and Ireland, and in some places in such abundance as to be a great pest to the farmers. It is said to be very fond of salt, and the term *Souslik*, meaning *dainty-mouth*, is given it in consequence. Many of them are caught on board the salt-vessels which navigate the Volga; the greediness of their appetite rendering them almost insensible to danger.

Four species of Spermophile are known in Europe, and are found in Western Asia: the *S. musicus*, *S. musogaricus*, *S. fulvus*, and *S. undulatus*. The *S. concolor* is a species found in Persia, which ravages the granaries and corn-fields to obtain the means of storing its burrows, on which account the inhabitants make active war against it, yet without sensibly diminishing its numbers.

More than a dozen species of this genus are found in North America. One of the most interesting is Parry's Marmot-Squirrel, *S. Parryi*. This is the *Seek-seek* of the Esquimaux, and the *Thœ-thiay*, or *Rock-Badger*, of the Chippeways. The ears are very short; body thickly spotted above with white on a gray or black ground; pale rust-colored beneath; face chestnut-colored; the tail one-third longer than the hind-feet, stretched out flat, black at the extremity, with a narrow white margin, rust-colored beneath; length of head and body, eight inches six lines; of the vertebræ of the tail, one inch six lines.

Richardson tells us that this Spermophile inhabits the Barren Grounds skirting the sea-coast from Fort Churchill in Hudson's Bay round by Melville Peninsula, and the whole northern extremity of the continent to Behring's Straits, where specimens precisely similar were procured by Captain Beechey. It is abundant in the neighborhood of Fort Enterprise, near the southern verge of the Barren Grounds, in 65° north latitude, and is also plentiful on Cape Parry, one of the most northern parts of the continent. It is found generally in stony districts, but seems to delight chiefly in sandy hillocks among rocks, where burrows, inhabited by different individuals, may be often observed crowded together.

One of the society is generally observed sitting erect on the summit of a hillock, while the others are feeding in the neighborhood. Upon the approach of danger he gives the alarm, and they instantly hurry to their holes, remaining, however, chattering at the entrance until the advance of the enemy obliges them to retire to the bottom. When their retreat is cut off they become much terrified, and, seeking shelter in the first crevice, they not unfrequently succeed only in hiding the head and fore part of the body, while the projecting tail is, as is usual with them under the influence of terror, spread out flat on the rock. Their cry in this season of distress strongly resembles the loud alarm of the Hudson's Bay squirrel, and is not very unlike the sound of a watchman's rattle. The Esquimaux name of *Seek-seek* is an attempt to express this sound. Hearne states that they are easily tamed, and very cleanly and playful when domesticated. They never come abroad during the winter.



PRAIRIE MARMOTS AND BURROWING OWLS.

The Prairie Dog, *S. Ludovicianus*, is sometimes called the *Wish-ton-wish*, and sometimes the *Prairie Marmot*, or *Prairie Marmot-Squirrel*. Its appearance is much like that of the marmots, being short, thick, and clumsy; but its cheek-pouches, though only three-fourths of an inch deep, place it with the spermophiles. Its body is about thirteen inches in length; on its back the color is reddish-brown, mixed with gray and black; beneath it is a dirty white. In several re-

spects its natural history is alike curious and interesting. It lives in burrows on the prairies of the Missouri and Platte rivers, and also farther south in Texas, New Mexico, and on the borders of Sonora and California. Often several hundreds of families are collected together in villages, called "Dog-towns" by the trappers and hunters. Before each hole there is a small mound, on which the marmots may be often seen sitting on their hind-legs, or stretched up and looking about. They are noisy creatures, uttering a sharp "chip, chip, chip," called barking. At each cry they jerk the tail, as if it cost them an effort to speak so loud. The holes go down at an angle of forty degrees for some distance, and then diverge sideways and upward. At the end of their burrows there is a bed of dry grass. They are very watchful, and if a person approaches they dive into their holes. If one will wait for fifteen minutes they will peep out, sometimes uttering a whistling note. They appear to feed more by night than by day. In the colder regions inhabited by this animal, it is believed that it hibernates, but not in the warmer. The flesh is said to be sweet, tender, and juicy.

One of the most remarkable circumstances in respect to the prairie-dog is, that their burrows are the resort of burrowing owls and rattlesnakes, these creatures sometimes apparently living in the holes with the marmots; and yet there is good evidence that they sometimes devour them. Lewis and Clark dug out a rattlesnake from a burrow which had a marmot in his stomach. There is reason to believe, also, that the owls feed on the young marmots, and sometimes even on the full-grown ones. It is supposed, furthermore, that they enter the burrows and eat the remains of such marmots as die there, and thus they serve as scavengers of the village. Nevertheless, the owls and marmots seem to live on the best terms with each other, and the rattlesnakes are at least tolerated, probably as hangers-on whom it is difficult to get rid of.

The following sketches, from Kendall's narrative of the Texan Expedition to Santa Fe, are written with equal truth and humor, and give an excellent account of one of the large marmot villages: "We had proceeded but a short distance, after reaching this beautiful prairie, before we came upon the outskirts of the commonwealth. A few scattering dogs were seen scampering in, their short, sharp yells giving a general alarm to the whole community. The first brief cry of danger from the outskirts was soon taken up in the center of the city, and now nothing was to be heard or seen in any direction but a barking, dashing, and scampering of the mercurial and excitable denizens of the place, each to his burrow.

"Far as the eye could reach the city extended, and all over it the scene was the same. We rode leisurely along until we had reached the more thickly settled portions of the place. Here we halted, and after taking the bridles from our horses, to allow them to graze, we prepared for a regular attack upon the inhabitants. The burrows were not more than ten or fifteen yards apart, with well trodden paths leading in different directions, and I even fancied I could discover something like regularity in the laying out of the streets.

"We sat down upon a bank, under the shade of a musquit, and leisurely surveyed the scene before us. Our approach had driven every one to his home in our immediate vicinity, but at the distance of some hundred yards, the small mound of earth in front of each burrow was occupied by a dog, sitting erect on his hinder legs, and coolly looking about for the cause of the recent commotion. Every now and then, some citizen more adventurous than his neighbor would leave his lodgings, on a flying visit to a friend, apparently exchange a few words, and then scamper back as fast as his legs would carry him.

"By and by, as we kept perfectly still, some of our near neighbors were seen cautiously poking their heads from out their holes, looking craftily, and at the same time inquisitively, about them. Gradually a citizen would emerge from the entrance of his domicile, come out upon his observatory, peek his head cunningly, and then commence yelping, somewhat after the manner of a young puppy, a quick jerk of the tail accompanying each yelp. It is this short bark alone that has given them the name of dogs, as they bear no more resemblance to that animal, either in appearance, action, or manner of living, than they do to the hyena.

"We were armed, one with a double-barreled shot-gun, and another with one of Colt's repeating-rifles, of small bore, while I had my short, heavy rifle, throwing a large ball, and acknowledged by all to be the best weapon in the command. It would drive a ball completely through a buf-

falo at the distance of one hundred and fifty yards, and there was no jumping off, or running away by a deer, when struck in the right place; to use a common expression, 'he would never know what had hurt him.' Hit one of the dogs where he would, with a small ball, he would almost invariably turn a peculiar somerset, and get into a hole; but by a ball from my rifle the entire head of the animal would be knocked off, and after this there was no escape. With the shot-gun, again, we could do nothing but waste ammunition. I fired at one dog, not ten steps off, having in it a good charge of buckshot, and thought I must cut him into fragments. I wounded him severely, but with perhaps three or four shot through him, he was still able to wiggle and tumble into his hole.

"For three hours we remained in this commonwealth, watching the movements of the inhabitants, and occasionally picking off one of the more unwary. No less than nine were got by the party, and one circumstance I would mention as singular in the extreme, and showing the social relationship that exists among those animals, as well as the kind regard they have for one another. One of them had perched himself upon the pile of earth in front of his hole, sitting up, and exposing a fair mark, while a companion's head was seen poking out of the entrance, too timid, perhaps, to trust himself farther; a well-directed ball from my rifle carried away the entire top of the former's head, knocking him some two or three feet from his post, perfectly dead. While reloading, the other boldly came out, seized his companion by one of the legs, and before we could reach the hole, had drawn him completely out of sight. There was a touch of feeling in the little incident, a something human, which raised the animal in my estimation, and ever after I did not attempt to kill one of them, except when driven by extreme hunger.

"Prairie-dogs are a wild, frolicsome, mad-cap set of fellows when undisturbed, uneasy, and ever on the move, and appear to take especial delight in chattering away the time, and visiting from hole to hole to gossip and talk over each others' affairs; at least, so their actions would indicate. When they find a good location for a village, and there is no water in the immediate vicinity, old hunters say they dig a well to supply the wants of the community. On several occasions, I crept close to their villages, without being observed, to watch their movements. Directly in the center of one of them, I particularly noticed a very large dog sitting in front of the door or entrance to his burrow, and by his own actions and those of his neighbors, it really seemed as if he were the president, mayor, or chief; at all events, he was the 'big dog' of the place.

"For at least an hour I secretly watched the operations in this community. During that time, the large dog I have mentioned received at least a dozen visits from his fellow-dogs, which would stop and chat with him a few moments, and then run off to their domicils. All this while, he never left his post for a moment, and I thought I could perceive a gravity in his deportment not discernible in those by whom he was surrounded. Far is it from me to say that the visits he received were upon business, or had any thing to do with the local government of the village, but it certainly appeared so. If any animal has a system of laws regulating the body politic it is certainly the prairie-dog."

Mr. Kendall further tells us that this animal enters his burrow with a half-somerset, knocking his hind-feet together as he pitches headlong into the blackness below. Before the spectator has recovered from the laugh which this drollery excites, he will see the dog stealthily thrust his head out with a gaze of curiosity and impertinence.

The Leopard Spermophile is one of the most beautiful of all the striped species of spermophile. It resembles the chipping-squirrel in size and appearance, but exceeds that pretty creature in the splendor of its skin. The general color is bright reddish-brown, but along the back are five deep brown stripes, each having a row of square white spots running through it. These dark-colored stripes are separated from each other by straight lines of yellowish-white. There are, also, on each side, two less distinct brown stripes, not spotted. Thus the skin of this animal presents nine dark stripes—five of them spotted—and eight yellowish-white stripes.

It is not strange that a creature thus distinguished should have attracted great attention. Schoolcraft calls it the *Leopard Ground-Squirrel*, which is a good descriptive title; Godman calls it *Hood Marmot;* Harlan denominates it *Arctomys tredecim-lineatus*, or *Thirteen-lined Marmot;* Gervais, *Spermophile à treize lignes.* The body is six inches long; the tail, with the

hair, four and a half. It is found in the prairies east of the Rocky Mountains, from lat. 55° south to Mexico, and often takes up its residence near the grounds of the settlers. It is lively as it is beautiful, making deep, winding, bifurcated burrows in the earth, at the mouth of which it may be often seen. If any one approaches it darts into its hole, and continues to utter a chirping sound of anger and warning. Like the other spermophiles it uses its cheek-pouches to carry off nuts and other things to its nest. The females produce from five to ten young at a birth, about the first of June.



THE LEOPARD SPERMOPHILE.

The Annulated Squirrel Marmot, *S. annulatus*, is of a reddish-brown, speckled below with black. The length of the body is eight inches; the tail, including the hair, nine inches. This is annulated with seventeen to twenty bands of black. In its structure and character it seems a sort of connecting link between the squirrels and marmots: it has the lightness of form of the first and burrows like the last. It has cheek-pouches, which gives it a place among the spermophiles. This species are found on the western prairies.

Franklin's Marmot Squirrel, *S. Franklinii*, is yellowish-brown, thickly speckled with black above; below it is greyish-white. The length is nine and three-quarter inches; the tail, with the hair, five and three-quarters. It inhabits the plains in the western British territories and Oregon, and burrows among thickets in the sandy soil. Like most of the spermophiles, it has a harsh, whistling note, expressive of alarm or anger.

Say's Marmot Squirrel, *S. lateralis*, is the *Arctomys lateralis* of Richardson, and the *Small Gray Squirrel* of Lewis and Clark. It is a true spermophile, though resembling the *Tamias*, of which the *Chipping-Squirrel* is a familiar example. Above, it is brownish-ash; the sides and belly are yellowish-white. On each side of the body is a light longitudinal stripe, banded on both sides by a dark stripe, giving it the appearance of having four black stripes running along the back. The general effect is very beautiful. The length of the body is eight inches, and the tail, with the hair, three inches and a half. It is found in the Rocky Mountains, about latitude 57°.

Peale's Spermophile, *S. Pealei*, is a species which appears to have been discovered by Pike's Exploring Expedition, but neither its habits nor locality are known. It is somewhat larger than the chipping-squirrel, and has four brown and five white stripes. Its length is six and a half inches.

The Mexican Marmot Squirrel, *S. Mexicanus*, the *S. spilosoma* of Bennett, is reddish-brown, spotted with white above; the under parts are a pale buff-white; the length ten inches. This is a beautiful and interesting species, lively as a squirrel in its disposition and movements, with a very bright and sagacious expression of countenance. When domesticated, it becomes gentle and

affectionate, preserving all its native love of gaiety and frolic. It feeds standing on its hind-legs, like a squirrel, using its paws as hands. It will eat grasses, grain, fruits, and cooked food generally. It has a sort of human nature about it, for, when threatened, it chatters, grits its teeth, and becomes furious; but, if fed and caressed, it is speedily restored to its good-natured and pleasant ways. It makes a nest of tow, or other soft materials, and is fond of burying itself in it, even in warm weather. It sleeps luxuriously, sometimes on one side, and sometimes on its back, occasionally yawning and stretching like a lazy boy.

This species is common in Mexico, where it is called *Urion*—a term, however, applied to some other burrowing animals. It is also met with in Texas and California. It inhabits wooded districts, but is a frequent pet on the plantations. The Mexican women fondle it, and permit it to run over their shoulders and nestle in their bosoms.

The Long-tailed Spermophile, *S. macrourus*, is thirteen inches long, and the tail, with the hair, ten inches. The fur is coarse, and mottled with black and grayish-white along the back and sides; the feet and under parts are light gray, with dusky freckles. The tail is moderately bushy. It is a very lively species, climbs trees with facility when it has need, and feeds on grain, grasses, nuts, and roots. It is found in Northern Mexico, and in some parts is abundant. There appears to be a standing grudge between the woodpeckers and this spermophile, the former often combining to the number of half-a-dozen in an attack upon him. They dart at him, and snap their long sharp bills around his head, and, doubtless, often give him a pungent tweak. The cause of this hereditary quarrel may be, that the spermophile often takes possession of the hole which the woodpecker has chiseled out of a dry trunk or limb of a tree, unscrupulously appropriating the premises, and all the hereditaments, to his own use and behoof.

Harris's Marmot Squirrel, *S. Harrisii*, is of the size of the chipping-squirrel. It has a narrow white stripe running along on each side of the back, the ground being yellowish-gray; the under surface is ashy-white. The length of the body is a trifle less than six inches; the tail, with the hair, four and a half inches. Its habits are little known. It is found on the western slope of the Rocky Mountains, within the verge of Oregon.

Townsend's Spermophile, or the American Souslik, *S. Townsendii*, is of the size of the common red squirrel. The upper surface is brownish-gray, sprinkled with white; beneath it is yellowish-gray; length, eight to nine inches; tail, with the hair, one inch and a half. It greatly resembles the souslik of Europe and Asia, the spots on the skin, however, being finer and more numerous and irregular. It is found in Oregon, and, in summer, is numerous along the banks of the Walla-Walla; it gets very fat, and is devoured by the Indians. It appears to retreat to its holes early in the autumn, where it lives in families. After its hibernation, it comes forth in the spring greatly emaciated.

Douglass' Spermophile, *S. Douglassii*, has a short head and long ears, the body being pale brown, with faint transverse bands of brown and white. It has in general a squirrel-like appearance, but its coarser fur and cheek-pouches mark it as a true spermophile. The length of the body is about fourteen inches; the tail, with the hair, nine inches. It is found on the banks of the Columbia River.

Beechey's Spermophile, *S. Beecheyi*, resembles the preceding, and is found in California.

The Tawny American Marmot, or Richardson's Spermophile, *S. Richardsonii*, is yellowish-gray on the back; beneath, pale grayish-orange. The ears are very short; the body short and thick, being only nine inches and a quarter long; the eyes are large, the legs short, the tail bushy. It resembles the squirrels, but is less active in its movements and less elegant in its attitudes. It inhabits the sandy prairies along the branches of the Saskatchewan river, and the Rocky Mountains from latitude 45° to 38°. The burrows are usually situated on some sandy hummock; the earth scooped out is formed into a little mound, on which the animal sits, so that he may overlook the surrounding group and reconnoiter before he ventures to make an excursion. Four or five live in a burrow; they appear to hibernate. They feed on young buds in spring, and tender herbaceous plants in summer, and in winter on leguminous plants and the seeds of grasses.

This little remote, harmless creature, like most of its kind—indeed, like almost every other wild animal under the sun—nay, like man himself—seems to live in the midst of fear and danger.

It is the prey of the badgers, which pursue it even to the depth of its burrows; of falcons, which pounce down upon it from the air, and the arrows of the Indians, which reach it from a distance. The first lessons of life, everywhere, are comprised in the proverb *look e'er you leap*, and how well animals—beasts, birds, reptiles, fishes, insects—learn and practice them is evinced in their sharp, watchful, fearful looks on every occasion, and especially in the sly, circumspect manner in which they go forth, and the trembling alacrity with which they retreat to their hiding-places on the slightest intimation of danger. A few only of the stronger and more audacious species seem insensible to fear; all the rest live surrounded with dangers, and obtain subsistence only in the midst of perpetual apprehension. The tame animals are, for the most part, free from these mental harassments, but they pay the price in being sacrificed to man as his pleasure or his whims may dictate. Man's difficulties are different in form and kind, yet are they equally dreadful and numerous. He is exempt from fear of the claws and teeth of rapacious animals, but he is exposed to the attacks of equally destructive social vultures and tigers, and even if he escape these, he is supposed to be surrounded with the invisible feræ of the spiritual life. And yet, after all, says the philosophical Paley, "this is a happy world." So, indeed, it is, to bird, and beast, and creeping thing, and to man also, despite all its dangers and all its cares—

> For who, to dumb forgetfulness a prey,
> This pleasing, anxious being e'er resigned;
> Left the warm precincts of the cheerful clay,
> Nor cast one longing, lingering look behind?



PALM-SQUIRRELS.

Genus TAMIAS: *Tamias*, the *Ground-Squirrels*.—Most naturalists consider the *Tamias*—a term signifying *keeper of stores*—as merely a sub-genus of the *squirrels;* they have, indeed, a great resemblance to these animals, and are usually called squirrels, but as they have a more lengthened cranium, with cheek-pouches, and are at least partially earth-burrowers and dwellers in the ground, beside certain peculiarities in their dentition and in the formation of the ears and tail, they may fairly be regarded as constituting a genus by themselves.

One of the best known is the Palm-Squirrel, *Sciurus palmarum* of Linnæus, and the *Palmiste* of Buffon. It has plain ears; an obscure pale yellow stripe on the middle of the back, another on each side, a third on each side of the belly; the two last at times very faint; the rest of the hair on the sides, back, and head, black and red, very closely mixed; that on the thighs and legs more red; belly pale-yellow; hair on the tail does not lie flat, but encircles it, is coarse, and of a dirty yellow, barred with black; length about thirteen inches, of which the tail measures six inches. This is the description of Pennant. Mr. Bennett has figured two varieties in his "Zoological Gardens:" one was perfectly black, and exhibited no traces of the usual stripes; the other

had red eyes, and appeared to be an albino: it was of a dull reddish-white, marked with three very faint stripes of a still lighter hue. They were presented to the society in 1828, and are represented in the above engraving.

The palm-squirrels, which derive their name from being often seen on palm-trees, are common in East Indian towns and villages, often being seen running about the roofs of houses and old walls. The female places her young in holes of the latter. They are great destroyers of fruit, and are very familiar, entering houses to pick up the crumbs. They are easily tamed, and become interesting pets. They live in holes in the ground, but are exceedingly fond of running about on elevated places, on the roofs of lofty houses and tall trees. Pennant states that Governor Loten informed him that they lived much in the cocoa-tree, and were very fond of the *Sury*, or palm-wine, which is procured from it; on this account it obtained, among the Indians, the name of *Suricatsje*, or the *Little Cat of the Sury*.



THE TAMIA STRIATA.

The Burunduk, *Tamias striata*, called *Rugeriik* by the Tartars, is found in the northern parts of Europe and Asia. It is about five inches long, and of a fawn-color above, striped with five brown and two white bands; beneath, it is white. It is more wild than the preceding, and though it is lively, it has not the agility of the squirrel. It seldom climbs trees, except to escape an enemy or secure some favorite fruit. It makes its burrow below the roots of trees, in which it stores nuts and dry fruits. It is said, also, to fill other magazines in the same way. In transporting its supplies, it uses its ample cheek-pouches. Its nest is well lined with soft grass, and we may suppose it passes the winter comfortably, though confined to its underground home. It has a great resemblance in size, appearance, and habits to our little chip-squirrel, and has been considered of the same species by some authors; but recent examinations seem to render it highly probable that it is a distinct species.

Other foreign species of Tamias are the Burrowing-Squirrel, *Sciurus fossor*, of Senegal, with several other species found in Abyssinia; Lary's Squirrel, *Sciurus insignis*, of Java and Sumatra; Delessert's Squirrel, *Sciurus Delessertii*, of Hindostan.

Of the American species of Tamias, the *Sciurus Lysteri*, the well known Chipping-Squirrel, or Striped Squirrel, the *Hackee*, or *Chip-muck* of the United States, the *Ohiohin* of the Hurons, the *Striped Dormouse* of Pennant, is the most interesting. Its color is brownish-gray above, with five longitudinal black stripes and two yellowish-white ones along the back; the under surface is white; the length of the head and body is about six and a half inches; the tail, with the fur, four and a half. It lives in holes in the earth, and is usually seen on the ground, or on rocks, fences, and stumps, and is hence often called the *Ground-Squirrel*. Though not becoming tame upon domestication, and being often seen in the most solitary woods and forests, it is even more common near the abodes of men, especially in the villages, where it may be seen around the farms and gardens, and even running along the fences of the streets. It is not swift, but is lively and playful, and though careful not to allow a very close approach, it will come out of its holes and look at a stranger, and often pursue its avocations without being disturbed by his presence.

In the autumn this creature may be seen around the fields of Indian corn, and in the walnut and chestnut woods, filling his ample cheek-pouches, and carrying off his store to his granaries. His hole is generally placed near the roots of trees, or in a decayed stump, or among a heap of rocks, or in a bank of earth, and usually near the forests or fields from which he draws his supplies. Sometimes his retreat has two or three openings; it usually descends almost perpendicularly at first; then it rises with one or two windings, and at last, at the distance of eight or ten feet, terminates in a chamber lined with leaves, amid which the animals sleep. Three or four occupy the place together. There are several side-galleries, where the stores of wheat, buckwheat, hazel-nuts, acorns, Indian corn, grass-seeds, walnuts or chestnuts, according to the productions of the locality, are deposited. They are exceedingly provident, continuing to add to their supplies till forced into their houses by the inclemency of the weather. Often their stores are much beyond the necessities of the winter. The squirrels hibernate in these retreats, and become somewhat sluggish, but do not approach the unconscious torpidity of the marmot. The young, four or five at a birth, are produced in the spring, and beautiful little creatures they are when first led forth by the mother.

The Chipping-Squirrel rarely climbs trees, unless to escape pursuit, or perhaps occasionally to get at some desired fruit. It has a sharp chip, often changed into a gurgling sound when the animal escapes into his hole or conceals himself amid the recesses of a stone wall—seeming, in fact, to be a sort of scoffing laugh at the impertinence of the assailant. On other occasions, its chip becomes a sort of song, in which several squirrels in different parts of the forest seem to answer one another, and thus to fill the woods with a kind of merry chorus. Though not familiar, and seldom or never becoming reconciled to confinement, preserving always a rather sullen appearance, still this little creature is a general favorite. His voice is associated with the woods and bright spring and autumn mornings, and especially with those happy days of youth when every wood-ramble was an adventure, and even a chip-squirrel was game.

This animal commits no depredations upon the garden, the orchard, or the farm; if he ventures into the grain-field it is only as a gleaner. Nor is he included in the list of legitimate game, being quite beneath the notice of the sportsman. Even the dog rarely condescends to bestow upon him more than a bark, seldom having an opportunity of giving him a bite,—thanks to the caution of the squirrel in always keeping near a retreat and an admirable celerity in reaching it. Yet, despite these immunities, the chip-squirrel lives a life of unceasing peril. The woods that he occupies are the haunts of hawks of many kinds, perchance of foxes, wild-cats, lynxes, minks, and weasels, all thirsting for his blood. He never peeps from his hole but with the apprehension that these, or some of these, are ready to pounce upon him. Nor is he altogether safe even in his deep, winding burrow, intrenched as it may be in roots and rocks, for often the murderous weasel enters his den and strangles him in his bed.

Townsend's Ground-Squirrel, *T. Townsendii*, is somewhat larger than the preceding, the body measuring nearly seven inches. The tail is long—with the hair, measuring five inches. The upper surface is a dusky brown, with five black stripes along the back; the under surface is of a light ashy hue. Though in several respects different from the chip-squirrel, its habits seem to be very similar to those of that animal. Like that, it often mounts a stump in the woods, and, for a long time, keeps up a continual clucking, being answered by another in a different part of the forest. The note resembles that of the dusky grouse, and hunters are frequently deceived by it. It is found in the Rocky Mountains, from the thirty-seventh to the forty-fifth degrees of latitude.

The Four-lined Squirrel, *T. quadrivittatus*, is smaller than the chip-squirrel, but resembles it in appearance. Its sides are reddish brown; beneath it is white; along the back are five dark brown stripes and four light ones. The head and body are a trifle over four inches long. It is found in the northwestern regions, as far as lat. 50°; and southward along the Rocky Mountains to the source of the Arkansas river. It is, like the chip-squirrel, lively and restless, living in burrows with several openings, usually made at the roots of trees. It often annoys the hunter by giving notice of his approach to the wild inhabitants of the woods, by its angry, chirruping cry. In autumn, it is seen with its cheek-pouches filled with seeds, carrying them to be stored

in its retreat for the winter supply. Sometimes it mounts the trees, but generally is seen upon the ground.

Sir Francis Head gives us the following account of his meeting with a squirrel in Canada, probably one of this species. "I was waiting the approach of a large flock of wild-fowl; but a little villain of a squirrel on the bough of a tree close to me, seemed to have determined that even now I should not rest in quiet; for he sputtered and chattered with so much vehemence, that he attracted the attention of my dog. This was truly mortifying; for he kept his eyes fixed on the squirrel. With my hand, I threatened the little beast; but he actually set up his back and defied me, becoming even more passionate than before; till, all of a sudden, as if purposely to alarm the game, he dropped plump within a couple of yards of Rover's nose. This was too much for the latter to bear, so he gave a bounce and sprang upon the impertinent squirrel; who in a second was out of his reach, cocking his tail and showing his teeth, on the identical bough where he had sat before. Away flew all the wild-fowl, and my sport was completely marred. My gun went involuntarily to my shoulder to shoot the squirrel; but I felt I was about to commit an act of sheer revenge on a courageous little animal, which deserved a better fate. As if aware of my hesitation, he nodded his head with rage, and stamped his fore-paws on the tree; while in his chirruping, there was an intonation of sound which seemed like contempt. What business had I there, trespassing on his domain, and frightening his wife and little family, for whom he was ready to lay down his life? There he would sit in spite of me, and make my ears ring with the sound of his war-whoop, till the spring of life should cease to bubble in his little heart."

Genus SQUIRREL: *Sciurus.*—From the *Ground-Squirrels* we now come to the *Tree-Squirrels*, which are, at the same time, the *True Squirrels.* They are a numerous, very pretty, and highly amusing genus of rodent animals, of small size, which reside and find their food chiefly in trees, and are as much at home there as the handed animals, which they in general surpass in the velocity of their motions, while their aspect is as pleasing as that of the monkeys is repulsive. Squirrels are exceedingly numerous as a genus, and their characters at once distinguish them from all the rest of the rodentia.

They are all possessed of clavicles, which enable them to use their fore-legs like arms, either in grasping or in conveying substances to the mouth, but in doing so they have to use both legs, as the paws are not sufficiently prehensile to be used as hands. The character from which they get the name *Sciurus*, which means "shadowing tail," and of which the common term squirrel is merely a corruption, is the form of the tail. This tail is very long, and it is usually covered with long hair, or fur, which diverges into two parts on the under side, something after the manner of the two webs of a feather; and the length is generally sufficient to overshadow the whole body, when the tail is brought forward curving over the back. The gnawing-teeth, in the lower jaw of the squirrels, are very much compressed. The hind-feet have five toes, and the fore-feet four, but sometimes the inner toe also appears on the fore-feet as a simple tubercle; they have four tuberculous teeth on each side of both jaws, and a small one in advance of the rest in each side of the upper jaw, but it falls out at rather an early age. The claws upon their toes are crooked and very sharp-pointed, so that they can take hold of small inequalities of the bark of trees, and the toes have a certain degree of lateral motion, by means of which they can grasp toward the center of the foot.

They are very agile, formed for climbing and leaping, and even when they are in a state of confinement, and abundantly fed, they do not feel at home unless they have in their cage a small mill, or tread-wheel, upon which they can exercise themselves. Their spine is very elastic, and accords well with the ready action of the joints of their limbs, so that they are nearly as nimble on the ground as they are in climbing and scrambling about among the branches. Their action upon the ground is not running but leaping, in which the elasticity of the spine comes into play at every step; and their action is something intermediate between that of the hare and the jerboa, less of a running action than the first, and less of a set of boundings from the hind-feet than the second. Their limbs are all articulated, so that they can be stretched outward, which prevents that steady motion parallel to the mesial plane of the body which is essential in an animal which has habitually to walk the ground.

But while their members are thus not of a walking character, neither do they resemble the flying extremities of the bats, nor the climbing ones of the handed animals or the sloths. Their feet, both the fore ones and the hind, are fitted for making a firm plant on a very slender branch, either longitudinally or across. This, of course, is done by a sort of grasping; but still it partakes much more of the character of a mere plant than that of the handed animals, and is performed in a correspondingly shorter time. Their motion along the small twigs near the top of a row of tall trees is thus a kind of running, and running which is very neatly as well as very swiftly performed. Their hind-legs are a little longer than their fore, but only a mere trifle, as their running style of motion requires that they should have nearly equal command and use of all their legs. In this may be seen the difference between them and the hares and jerboas on the one hand, and the tree-apes, which have not the tails prehensile, on the other. The leaping animal has the hind-legs long, and the muscular action of the body very much concentrated upon them. The climbing animal has the fore-legs long, and the concentration upon them. The squirrel holds an intermediate place, and this is the reason why we consider its motions on the ground more graceful than the leaping of the jerboa, and its motion in the tree more so than the climbing of the ape. Their motions are indeed quite a study in animal mechanics; and on account of their lightness, their gentleness and cleanliness, they are a very pleasing study.

The eyes of the squirrels are bright and large for the size of the animals, and there are some peculiarities in them which are worthy of attention. The pupils are large and rather oval, with the largest diameter placed in a horizontal direction; and there is no color reflected from the choroid membrane. Hence it is probable that their vision is very keen, and that they can see an object clearly with very little light. They require this, for they have to find their food, and also their footing, the latter often very quickly, in the close shade of the leaves. It is probable that their hearing is as acute, for their ears are remarkably well developed, and they often terminate in tufts of fur, which are generally regarded as increasing the acuteness of the sense.

In woods, their chief food is nuts and other small fruits; but they are also fond of the saccharine juices of plants; and in some parts of our country, where they are numerous, they do serious damage to the plantations of Indian corn. They are animals of temperate, and even of cold countries, as well as of warm ones. They abound so much in many places of the north that they are caught in traps, as well for their flesh as their skins. The great natural forests are their chief abodes, where they dwell in solitude or in society, according to the species. But even the most solitary of them are usually found in pairs, which are understood to associate for life. Their nests are usually little spherical cabins, formed of twigs and leaves near the tops of the highest trees, and with the opening above. In such places they and their young are out of the reach of all quadruped foes; but they occasionally become the prey of ravenous birds, when these roam on the wing over the forest; and yet the situations in which they are placed render them pretty secure from these foes also. With the exception of Australia and the remote islands, squirrels of one species or another are found in all parts of the world; in Europe from Lapland to the extreme south; in all parts of Asia, Africa, and North America; and they are generally as abundant as they are widely distributed, for the woods which suit their economy often swarm with them.

The Common Squirrel of Europe, *S. vulgaris*, called "The Squirrel" by the English, is the *Ecureuil* of the French; *Scojattolo*, *Schiarro*, and *Schiaratto* of the Italians; *Arda*, *Ardilla*, and *Esquilo* of the Spaniards; *Eichhorn* and *Eichhörnchen* of the Germans; *Inkhoorn* of the Dutch; *Ikorn* and *Graskin* of the Swedes; *Ekorn* of the Danes. Its length, including the tail, which measures about six inches three lines, is about fourteen to fifteen inches. Its general color is a bright red, varied with gray on the flanks. Mr. Bell, after stating that it is liable to considerable variety of color, becoming gray in the northern regions, and quoting the passage in "Lachesis Lapponica," which relates how the inhabitants of the Lapland Alps procure a number of these species in their gray or winter clothing for the sake of their skins, proceeds to remark that even in England a certain degree of change takes place in the color of the fur in spring and autumn. In summer the fur is coarser and more uniformly red, and the pencils of hairs on the ears are lost; in winter a grayish tint appears on the sides; the pencils on the ears are long and well de-

veloped, and the fur is softer and fuller. In July, and not till then, the summer change is perfect. This species is found generally in Europe and the north of Asia.

"This animal," says Pennant, "is remarkably neat, lively, active, and provident; never leaves its food to chance, but secures in some hollow tree a magazine of nuts for winter provision. In the summer it feeds on the buds and young shoots, and is particularly fond of those of the fir and pine, and also of the young cones. It makes its nest of the moss or dry leaves, between the fork of two branches, and brings four or five young at a time. Squirrels have their pairing time early in the spring, when it is very diverting to see the female feigning an escape from the pursuit of two or three males, and to observe the various proofs they give of their agility, which is then exerted in full force." This species is a great favorite in a state of domesticity, maintaining all its pleasing airs and graces, and becoming quite tame and familiar. It is a common pet in cages, and has been known to be so attached to its master as to follow him through the fields, and even the streets of a town.

The Little Gray Squirrel, of Northern Europe, has been supposed by many naturalists to be a mere variety of the preceding. Its fur is exceedingly soft and light, and is of a beautiful gray, tinged with fawn. As if conscious of this beauty, it spends much time in dressing its fur. It lives on nuts, and has a sharp cry, which often betrays it to the hunter.

The Alpine Squirrel, *S. Alpinus*, is found in the Alps and Pyrenees; it is of a deep brown, above spotted with light fawn; below it is a pure white. In size and habits it resembles the common squirrel.

The Caucasian Squirrel, *S. Caucasicus*, is found in the Caucasian Mountains and in Asia Minor. Its color is a grayish-brown above, and yellowish-brown below.

The Madagascar Squirrel, *S. Madagascarensis*, is nearly twice the size of the European squirrel; it is nearly black above, and yellowish-white beneath. The tail is the length of the body.



THE BARBARY SQUIRREL.

The Barbary Squirrel, *S. Getulus*, is about the size of the European squirrel, being nearly ten inches in length. It is grayish-brown, with four white longitudinal bands along the back. It inhabits Northern Africa, and lives on the palm-trees. The *S. cepapi* is yellow above, marked with blackish-brown; below it is yellowish-white; length fifteen inches, with the tail. It is found in Southern Africa. There are also in Africa the *S. Abyssinicus* and *S. annulatus*, which are thought by Ehrenberg to differ from the common squirrels, and to constitute a distinct genus, to which he gives the name of *Xerus*.



THE MALABAR SQUIRREL.

Asia has probably twenty species of squirrels, among which is the Malabar Squirrel, *S. maximus*, the largest of the genus, being the size of a cat. A part of the body above is brilliant red and a part intense black; the under parts are of a bright yellow. It is almost as brilliant as a macaw, while it has all the grace and vivacity of the squirrels. It lives upon the palm-trees along the coast of Malabar.

The Indian Squirrel, *S. Bombayus*, is sixteen inches long, and has a tail seventeen inches. It is found in Bombay, and by some is supposed to be a variety of the Malabar squirrel.

Prevost's Squirrel, *S. Prevostii*, is nearly of the size of the European squirrel; it is black above, yellow on the flanks, and chestnut-color beneath. It is found in India. Here, also, is found the Indian Red Squirrel, *S. erythræus;* it is a little larger than the preceding, and is yellow and brown above and fawn below.

Leschenault's Squirrel, *S. Leschenaultii*, is somewhat larger than the European squirrel; it is a foot long, and has a tail of the same length. It is a light brown above, and yellowish-white below, and is a native of Java. Here also is found the Banana Squirrel, *S. plantani*, seven inches long, gray above, and yellow below; and the *S. bicolor*, red above and fawn beneath. The *S. auriventer* is of Sumatra.

The Dandoleana, or Rakea, *S. Ceylanensis*, greatly resembles the Malabar squirrel; its skin is black above and yellow below; it is a native of Ceylon.

The *S. hypoleucus* and *S. ephippium* are of the Sunda Isles.

North America rivals Asia in the number of its species of squirrels, there being about twenty kinds described and verified. The Red Squirrel, or Chickaree, which has acquired the absurd name of Hudson's Bay Squirrel and *S. Hudsonius*, in the books, is the Common Squirrel of the United States, being familiarly known in nearly every state in the Union. It is about eight inches long, with a tail, including the hair, about six inches long. The color is a reddish-brown on the upper surface, often with a tinge of gray; beneath it is white.

In its habits it is lively and restless to a remarkable degree, running along the fences and branches of the trees, often leaping from one tree to another with the greatest lightness and agility, and, as if these exertions were not enough to exhaust its exuberant spirits, it keeps constantly



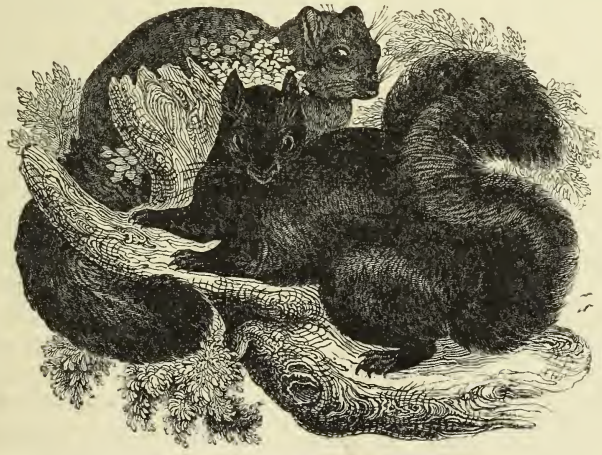
RED SQUIRREL. CHIP-SQUIRREL. CAT-SQUIRREL. MIGRATORY SQUIRREL.

moving its tail in spasmodic jerks. It lives singly or in pairs, though several are usually found on the same grounds; it occupies alike the forests, the fields, and orchards, and occasionally the streets of the villages. It has a sort of impertinent familiarity in its ways toward mankind, sometimes coming upon the trees near the houses, and if set upon by the dog, or watched by the cat, or assaulted with a stone from a boy, it is likely to commence a chattering salutation or oration, consisting of "chickaree-chickaree-quilch-quilch-chickaree-chickaree," continued for twenty minutes, during which time it seems to exhaust the whole vocabulary of abuse and vituperation. During this performance it keeps jumping about in the tree, its tail jerking, its head downward, and its gleaming eyes looking upon the object of its denunciation with a droll mixture of fun and fierceness. All this while it leaps and jumps and flies from place to place, seeming to consider it all a frolic himself, while he desires the object of his addresses to look upon it as a terrific display of threatened vengeance. The general reputation of the animal is that of a sharp Yankee squirrel, full of conceit, vivacity, impertinence, and selfishness; he harms nobody, yet is not a favorite; when taken into captivity, he does not become tame; he manifests attachment to nobody, and seems constantly absorbed in two desires: one for food, and one to get away and enjoy his liberty. His flesh is not much esteemed, and he is generally permitted to pass by unharmed by the sportsmen. Nevertheless, the chickaree, at liberty and sporting in his native haunts, is always an object of interest, for he is really a beautiful example of that combination of grace, vivacity, and energy which characterize his genus. He also maintains his active habits through the whole year, alike in spring, summer, and autumn, and even amid the snows of winter; certainly, it would not be easy to name another vagrant of the field or forest which contributes more to enliven the landscape than the chickaree. He is often, during the cold season, the only living thing that is seen in the woods; but for him all nature would often seem to have been entombed beneath the snow. In looking closely at the economy of this animal, we find many things to admire. He is exceed-

ingly neat and cleanly in his person: while enjoying to the full the bounties of summer, he takes good care to lay up an ample store for the winter. He feeds on walnuts, chestnuts, butter-nuts, hazel-nuts, and seeds of various kinds, sometimes taking a bite out of the best side of a sweet apple, or making a meal of Indian corn from the fields, without asking leave of the proprietor. Hoards of nuts are deposited by these provident creatures in certain hiding-places, as under the leaves, beneath logs, amid heaps of brush, in holes in the ground, or in the recesses of a hollow tree, and are resorted to in case of need. Their activity and industry are indeed admirable. Before the nuts are fully ripe they are up and out by break of day, and having ascended the tree, proceed to gnaw off the stems containing the fruit. Having thus dropped a sufficient quantity, they descend, gather the fruit, and having made a breakfast, carry the rest to their granaries. When the fruit has matured and fallen to the earth, they are as busy as farmers in the time of harvest. The quantity they collect and store away is sometimes enormous; a bushel and a half of hickory-nuts have been found in a single depository in a hollow tree. Sometimes the hogs root out the nuts that are less securely housed, and what would have sufficed for a squirrel during a winter, makes but a single meal for the fortunate but gluttonous finder.

The Red Squirrel is found from Labrador to the Carolinas, and is especially common in the Eastern and Middle States. He accommodates himself to his situation in respect to his abode; if he chooses to make his nest in some out-house around a farm, he will construct it of the feathers which chance to be at hand; in the woods, he builds a nest of twigs, interwoven with leaves, in the high fork of a tree; or perchance he contents himself with some natural hollow in the branch or trunk of a tree. If he lives in a northern region, where the winters are long and severe, he will dig for himself a comfortable burrow in the ground. Though not loving the water, in case of need he can swim and dive, and make a respectable figure in both exercises. In short, the chickaree is a shrewd, lively, dexterous, industrious, Yankee squirrel, taking excellent care of Number One, and caring little about any body else.

The Common Gray Squirrel of the United States, sometimes called the *Northern Gray Squirrel*, and sometimes the *Migratory Gray Squirrel*—the *S. leucotis* of De Kay—next to the red squirrel, is the most common species in the New England and Middle States. It is at the same time a beautiful animal, and much esteemed as game, and hence is an object of general interest. The upper surface is of a hoary gray, with tawny shades on the feet and neck; the under surface is white. This is the common appearance, but it is subject to many variations; in some cases, a tawny tinge, or shade of brown or yellow, spreads over parts, or over the whole animal, while in others, these shades are altogether wanting. There is also a variety called the *Black Squirrel*, of the same form and size as the Gray Squirrel; its color is a brownish black, the animal appearing quite black on the trees. In summer, its color is somewhat faded. It is



THE BLACK VARIETY OF THE GRAY SQUIRREL.

rare in the New England States, and is nowhere so common as the gray squirrel; it is, however, often seen in the western parts of New York and Pennsylvania. It lives and breeds with the gray squirrel; is of the same size, form and habits; both white and gray are sometimes found among the young in the same nest.

The Gray Squirrel is ten to twelve inches long; the tail, which is bushy and very beautiful, ten to eleven inches. It is active and sprightly, living mostly in old forests where there are large trees of hickory, chestnut, or oak, and whether seen running aloft among the branches of these trees, or speeding over rocks, fallen trunks, and stumps upon the earth, is a truly splendid example of the genus to which it belongs. It goes abroad at sunrise for its food, and may be seen intently engaged in scratching amid the leaves, or scampering over the ground, or bounding with incredible leaps among the tree-tops. It frequently amuses itself by quacking or barking, its voice at such times ringing through the woods and often betraying it to the hunters. In the middle of the day it reposes in its nest, coming forth again a few hours before sunset to pursue its sports or its labors.

Its habitation for the summer is usually a nest of leaves in the fork of a tree; in winter, it occupies some hollow space in the branch or trunk of a tree, this being retained till the young, five or six in number, are produced, in May or June. They remain in the parental home, or under the parental charge, till the next spring, when they pair off and go to housekeeping for themselves. If taken young, these animals become somewhat tame, and are amusing and pleasing pets. They are often kept in cages with a revolving cylindrical box attached, in which they may be seen, as in a treadmill, exercising themselves with the greatest animation for several hours of the day. Sometimes these animals have been so far domesticated as to breed in the grounds around the house, coming to be fed when called, and running familiarly over the person. In Philadelphia, a numerous colony of these squirrels has been bred in an inclosed square, and are objects of the greatest interest and curiosity.

The Gray Squirrel feeds principally on nuts, grain, and seeds, though occasionally devouring the larvæ of insects; in the West, where it is abundant, it sometimes makes great havoc in the fields of Indian corn. In western Pennsylvania it was formerly a great pest, and in 1749, a premium of three pence being offered by the government for each squirrel killed, 640,000 were destroyed. They are far less abundant now, but in some of the unfrequented parts of our country they are still numerous. Even in New England they are found in most of the old forests, and in the autumn the shooting of gray squirrels is still a favorite sport.

The most remarkable feature in this species of squirrels is its occasional migrations, in great multitudes, over mountains and streams, across cleared fields and dense woods, seeming to be guided by some necessity as to food, or some imperious but inscrutable instinct. They have naturally a strong love of home and an innate dread of water; but under the impulse of such a movement, these creatures forsake their birth-places and venture into unknown regions, and launch themselves upon the bosom of the broadest rivers, often with a fatal result. These emigrations usually take place in autumn, and a multitude of these creatures, gathered from all the surrounding districts, may be seen pouring along like a stream, and sweeping over the fields and devouring every thing that comes in their way. It has been said, that on coming to a river each squirrel takes a piece of bark, and seating himself upon it as a boat, or placing it beneath his chin as a float, hoists his tail as a sail, and thus passes safely and speedily across. This beautiful story is, however, a mere fiction. These creatures, on coming to the water, after some little hesitation and running to and fro, launch into the waves, and paddle across as they may. They are poor swimmers, sink deep, and advance with considerable difficulty. In October, 1833, as I was descending the Ohio in a steamboat, one of these migrations—though not remarkable for the extent of the numbers—was in progress. When we were in the region of Marietta, we saw hundreds—perhaps thousands—of these creatures in the water, making for the southern or Kentucky shore. In all cases, we only saw the nose above water; many were dead and drifting down the stream; many were on the Ohio side, hesitating upon the banks, or resting on the trees, while we could see hundreds on the Kentucky side creeping, exhausted, upon the sandy banks, where, sad to relate, were men and boys with clubs ready to dispatch them. Similar accounts have often been

given; the march of far greater numbers has often been witnessed, but the cause of such strange movements is hidden in mystery.

The Black Squirrel, *S. niger*, must be distinguished from the Black Squirrel we have mentioned in the preceding article, and which is only a variety of the Gray Squirrel; the animal we now describe constitutes a distinct species. It is a little larger than the gray squirrel, being thirteen inches long, with a tail, including the hair, of the same length; the color is a glossy black, with a few straggling tufts of white hair. It is a lively and beautiful species, resembling the preceding in its habits. As the gray squirrel retreats before the red squirrel, so the black squirrel gives place to the gray squirrel. It is found in western New York and on the borders of Lake Champlain, and probably extends north and west to Lake Superior. The difficulty of distinguishing it from the black variety of the gray squirrel has prevented the exact determination of its geographical limits.

The Carolina Gray Squirrel, *S. Carolinensis*, is smaller than the gray squirrel we have described, the body being but nine and a half inches long, and the tail, to the ends of the hair, of equal length. It is of a rusty gray color above, and white beneath. In size and habits it resembles the chickaree. It is very abundant in the swamps of Carolina, usually making its nest in the trunk of a decayed cypress, and lining the same with Spanish moss or leaves. It often utters a bark as it leaps from tree to tree, or scratches for food among the leaves. It has the peculiarity of being abroad in the evening. On moonlight nights it pursues its gambols among the trees, often paying a penalty, however, by being snapped up by the owls. At other, and indeed at all times, this animal seems to stand in peril from a multitude of dangers. The rattlesnake, the black snake, and the chicken-snake, dart upon it from their ambush of grass and leaves; the gray fox and the wild-cat often seize upon it either by stratagem or stealth; the lynx pounces upon it from behind logs or heaps of brushwood. It would seem that existence thus encompassed with perils would hardly be worth the possession, but nevertheless, this little animal enjoys life while it lasts, and knowing nothing of to-morrow, darkens not its existence by evil bodings of the future.

The Fox-Squirrel, *S. vulpinus*, or *capistratus*, is a large, stout-built species, with coarse hair, subject to many varieties of color. The most common is the *Gray Variety;* this is light gray above and white beneath, with a white nose and white ears. The next is the *Black Variety*, which is white on the nose and ears, the rest, including the tail, being black. The *Mottled Variety* has the nose and ears white; head, belly, and thighs black; the tail and back dark gray. The *Alabama Variety* has, like all the rest of the species, the ears and nose white; the back is a rusty blackish-brown; the neck and head black; thighs and belly a bright russet color. These diversities of color have led to some confusion among naturalists, as the different varieties have been regarded as different species.

The Fox-Squirrel is fourteen and a half inches long; the tail, with the fur, an inch longer. It is a southern species, being common in the Southern States, yet occasionally found as far north as New York. It feeds on acorns, and nuts, and cones of pines; lives in forests of pines, mingled with oaks and hickories, and in the time of green corn makes long visits to the fields, and feasts on the luscious ears. It builds its nest in the hollow of some aged tree, usually an oak, and produces young in March or April. He lays up no stores in winter, and at that season goes abroad but seldom, and only in the middle of the day, evidently having the power of sustentation, during this partial hibernation, with little food. Toward spring he feeds on the buds of various trees. When surprised in the woods, he usually makes a rapid retreat to the hollow of a tree; if he fancies himself unperceived, he seeks concealment by lying flat on the limb of a tree. He has a kind of bark, which he sometimes utters as a sort of defiance on the close approach of a dog or hunter. He fights severely, and will often beat off a small dog. His hide is tough and he is tenacious of life, and when in the top of a tall pine is brought down with difficulty by a shot-gun. His flesh is not greatly prized.

This species, like other squirrels, is infected with troublesome larvæ during the summer. He is a late riser, and of a rather lazy habit for a squirrel, and perhaps suffers more than others from this cause. His size and length, however, keep him from the attacks of the hawks, and as he is not out at night, escapes the owls, wild-cats, and foxes.

The Cat-Squirrel, *S. cinereus*, is smaller than the fox-squirrel, yet larger than the gray squirrel, being a trifle over a foot long, with a tail about an inch shorter. It varies in color from light gray to nearly black; the prevailing colors are, however, gray, orange, and nearly black. Its form is peculiarly stout; the fur is somewhat woolly; the tail broad and flat. Its habits resemble those of other squirrels, though it moves with less activity; it is fat in autumn, and its flesh is more valued than any other species. It is found sparsely in the tall aged forests of the Middle States.

Douglass' Squirrel, *S. Douglassii*, resembles the chickaree, being, however, one-quarter larger, that is, somewhat over nine inches in length, with a tail six inches, including the fur. Its color is dark brown above and buff beneath. It abounds along the banks of the Columbia River, and lays up abundance of acorns and pine-cones as food for winter, during which time it is imprisoned in its nest.

The Red-Bellied Squirrel, *S. ferruginiventris*, is a trifle smaller than the Carolina gray squirrel, being nearly nine inches long, with a tail ten inches, including the fur. Its color is light gray above, though brown on the shoulders; beneath, it is a bright russet. It is a native of California, but its peculiar habits are little known.

Richardson's Columbia Squirrel, *S. Richardsonii*, is a beautiful little animal, six and a quarter inches long, with a rather short tail. Its color is a rusty gray above, and whitish beneath. It frequents the pine-trees in the high Rocky Mountains west of the great chain, and feeds upon the buds of the cones, which are large, white, and nutritious, and are esteemed good food by the Indians. It has a loud, jarring chatter, and frequently comes down from the trees nearly to the foot to reconnoiter a passenger, and if it disapproves, gives him a fierce scolding.

The Downy Squirrel, *S. lanuginosus*, is a trifle stouter than the chickaree, being nearly eight inches long, with a tail six inches. It is a beautiful creature, its fur being thick, soft and downy, superior in this respect to any other species. It is light chestnut-brown above, silver-gray on the sides, and pure white beneath. Its habits are little known; it, however, burrows in the earth, and appears to approach the spermophiles in its characteristics. It is found in the northwestern parts of North America, from Oregon to the Russian settlements.

The Weasel-like Squirrel, *S. mustelinus*, is thirteen inches long, with a tail thirteen inches; its color is glossy black; its body is long and slender; it inhabits the pine-forests of California, and feeds on the cones; it hides itself with great cunning and alertness in the thick evergreen foliage, and hence is rarely caught. Its young, like those of all other squirrels, are born blind, but of its other traits of character and habits we have no particular information.

Audubon's Squirrel, or Large Louisiana Black Squirrel, *S. Auduboni*, is eleven and a half inches long, with a tail of the same length. The fur is harsh, but glossy, black above, and brownish beneath. It frequents high grounds, and displays the usual vivacity of the genus. It is found in Louisiana, and is sometimes brought to the market of New Orleans.

Colonel Abert's Squirrel, *S. Aberti*, is thirteen inches long, tail eleven inches; the general color is dark gray above and white beneath. It is found in New Mexico.

The California Gray Squirrel, *S. fossor*, is twelve and a half inches long, the tail ten inches. The body above is light gray; beneath, white. It is a beautiful species, found in the pine-woods of California, where it lives on nuts, roving about from one locality to another. It has the habit of running much on the ground, and has a bark similar to that of the gray squirrel, which it often exercises on hearing the whistle of the Carolina partridges.

Fremont's Squirrel, *S. Fremonti*, is about as large as the chickaree, the tail being shorter than the body; the color is light gray above, and ashy-white below. The body is rather short and stout; the fur long and soft. It is found in the Rocky Mountains.

Sooty Squirrel, *S. fuliginosus*, is ten inches long, and the tail eight and a half inches; color, black above, tinged with yellowish-brown; below, reddish-brown. It appears, however, to be subject to some variations of color. It is found in the swampy regions of Louisiana and Mississippi.

Collie's Squirrel, *S. Collæi*, resembles the gray squirrel; it is nearly eleven inches long, with a tail nine and a half inches; above, its color is a mixture of brownish-black and yellow; below, cream-white. It is found in southern California and the adjacent parts of Mexico.

The Dusky Squirrel, *S. nigrescens*, is a large species, nearly equal to the cat-squirrel, with

an enormous length of tail; above, it is grayish-black; below, dusky yellow, the same color extending up the sides. The length of the body is twelve inches and a quarter; the tail, fifteen inches and a quarter. It is found in California.

The Soft-haired Squirrel, *S. mollipilosus*, is eight and a half inches long, the fur long and soft, of a dark brown above, and ash-color below. It is found in the northwestern parts of California.

The Long-haired, or Woolly Squirrel, *S. lanigerus*, has a stout body, and long, coarse hair, brownish-gray above and pale-brown below. Its length is nearly twelve inches, and its tail of equal length. It is found in the high northern portions of California.

The Hare-Squirrel, *S. leporinus*, is nearly twelve inches long, and the tail twelve and a half inches. It is grayish-brown above, like the European hare, whence its name; below, it is white. It is beautifully furred, and the long tail, bordered with white, gives it a splendid appearance.

Lewis's Squirrel, *S. annulatus*, is of a yellowish-gray above, and of a reddish-yellow below. The tail is thick and bushy, and annulated with black and white bands. This species was discovered by Lewis and Clark, in their northwestern tour, but we have no details of its habits or precise locality.

Clark's Squirrel, *S. Clarkii*, resembles the *S. fossor*, previously described, and is perhaps of the same species.

The Red-tailed Squirrel, *S. rubricaudatus*, is thirteen inches long, with a tail of nearly the same length, and of a red color; the body is light gray above, and a dirty buff below. It is found in the Western States.

The Orange-bellied, or Golden-bellied Squirrel, *S. sub-auratus*, is ten and a half inches long, and the tail twelve inches; the color, gray above, with a tinge of yellow; below, a golden yellow. It lives in the deep forests of Louisiana, and probably in Texas and Mexico.

Say's Squirrel, *S. Sayii*, is a grayish-black above; beneath, it is a bright fawn-color; length of the body, twelve inches; of the tail, thirteen inches. In size and form it resembles the cat-squirrel, and is found in the state of Indiana and the adjacent territories, where it feasts on pekan and other nuts, and sometimes commits considerable depredations upon the Indian corn crops.

The preceding descriptions are according to recognized authorities; Baird, however, regards several of these squirrels as mere varieties, and reduces the number of North American species to about a dozen.

There are several kinds of squirrel in South America, some, perhaps, identical with those we have described as belonging to North America. Of the species peculiar to that part of the continent is the Guerlinguet Squirrel, *S. æstuans*, found in Guiana and Brazil; it is of the size of the common European squirrel, of an olive-gray color, and feeds on the fruits of the palms. This has been made by F. Cuvier the type of a genus which he calls *Macroxus*, of which there are other species in India, Sumatra, Africa, and South America.

Among the South American species are the *S. stramineus*, of Peru, the hair of which is of a blackish hue, but having a golden straw-color at the tips, and the *S. igniventris*, of Bolivia, perhaps the same as the *S. ferruginiventris*, that we have described as of the United States.

THE CASTORIDÆ.

Of this family there is but a single genus, that of the BEAVER, or CASTOR, *Castor*, and a single species, *C. fiber*, of Linnæus. It is found in Northern Asia and Northern Europe, and in North America, and though there are some slight differences in appearance and habits, all are regarded as one species. The American variety is often called the *C. Americanus*. This animal was noticed by Herodotus and Aristotle, and Pliny gives a good account of it, and speaks of the *castoreum* which it yields, and which it appears was as much valued for medicine by the ancients as the moderns. He says that in his time the dealers in it resorted to various frauds and adulterations, as is done in our day in respect to many articles of merchandise. He tells an absurd story to the effect that the beavers being hunted chiefly for this drug—for at that period the fur does



BEAVER.—(See p. 383.)

not seem to have been greatly prized—and knowing this fact, were accustomed to bite off the part that yielded it!

This animal is furnished with two incisors and eight molars in each jaw, twenty in all; and is particularly distinguished from all the rest of the rodentia by a broad horizontally-flattened tail, which is nearly oval and covered with scales. There are five toes on each of the feet, but those of the hinder ones—somewhat resembling those of a goose—only are webbed, the webs extending beyond the roots of the nails. The second toe of these last is furnished with a double nail, or rather two, one like those of the other toes, and another beneath it, situated obliquely, with a sharp edge directed downward. There is also a less perfect double nail on the inner toe of the hind-feet.

The incisor teeth of the beaver are broad, flattened, and, as in most of the order, protected anteriorly by a coat of very hard orange-colored enamel, the rest of the tooth being of a comparatively soft substance, whereby a cutting, chisel-like edge is obtained; and, indeed, no edge-tool, with all its combinations of hard and soft metal, could answer the purpose better. In fact, the beaver's incisor tooth is fashioned much upon the same principle as that followed by the tool-maker, who forms a cutting instrument by a skillful adaptation of hard and soft materials till he produces a good edge. But the natural instrument has one great advantage over the artificial tool; for the former is so organized that as fast as it is worn away by use, a reproduction and protrusion from the base takes place, and thus the two pairs of chisel-teeth working opposite to each other are always kept in good repair, with their edges at the proper cutting angle. When injury or disease destroys one of these incisors, its opposite, meeting with no check to resist the protrusion from behind, is pushed forward into a monstrous elongation. So hard is the enamel, and so good a cutting instrument is the incisor tooth of the beaver, that, when fixed in a wooden handle, it was used by the Northern Indians to cut bone, and fashion their horn-tipped spears, &c., till it was superseded by the introduction of iron, when the beaver-tooth was supplanted by the English file.

The power of these natural tools is such, that a beaver will bite off a sapling of the size of a

walking-stick at a single effort of its teeth. Lewis and Clark, who saw their effects on the banks of the Missouri, make the following statement: "The ravages of the beaver are very apparent; in one place the timber was entirely penetrated for a space of three acres in front on the river, and one in depth, and great part of it removed, although the trees were in large quantities, and some of them as thick as the body of a man."

Richardson thus speaks of this part of their operations: "When the beaver cuts down a tree it gnaws it all round, cutting it, however, somewhat higher on the one side than the other, by which the direction of its fall is determined. The stump is conical, and of such a height as a beaver sitting on his hind-quarters could make. The largest tree I observed cut down by them was about the thickness of a man's thigh—that is, six or seven inches in diameter—but Mr. Graham says that he has seen them cut down a tree which was ten inches in diameter." This is, no doubt, an exaggeration, or at least very uncommon. Beavers have no canine teeth.

The length of the head and body of a beaver is thirty-six to forty inches; the tail is about eleven inches. In the pairing season it utters a kind of cry resembling a faint groan. Owing to the shortness and inequality of its limbs, the gait is waddling and ungraceful; this effect is increased by the clumsiness of its figure, and the difficulty it seems to have in dragging after it its cumbrous tail. The latter, however, becomes useful in the water, where the animal spends the greater part of its time, sometimes being employed as a paddle, and sometimes as a rudder. The color is a reddish-brown; there are varieties, however, some of which are flaxen-colored, and some black. There are albinos which are white. The scientific names of these are, *C. f. varia*, *C. f. nigra*, and *C. f. alba*.

The young of the beaver, five to seven at a birth, are produced in April or May, the eyes being open; in a month, they follow their mother into the water, but remain with her a year, sometimes two years, being kept in a place of safety. Sometimes a dozen beavers dwell together. They are caught at all seasons, being fat in autumn, but falling off in winter. They have been found weighing from thirty to sixty pounds. Their common food is the bark of trees—birch, willow, and cotton-wood—and the roots of aquatic plants, especially the pond-lily; in summer they wander some distance from the water, and feed on berries, leaves, and various kinds of herbage. They are said occasionally to devour fish, but this is not probable. Their fur consists of two sorts, one composed of long, stiff, and elastic hair; the other, of a fine, soft, compact down, which gives extraordinary value to the skin.

It appears that among the beavers there are some lazy ones which do not, or will not, assist in the general labors of the association. These, as might be expected, are all males, and are beaten off by the community, and often are injured by having their tails cut off, and by other wounds. It has been suggested that they are disappointed lovers, and strange as it may appear, there seems some reason for this idea. Pennant says they are called old bachelors. They do not build dams, but dig holes from the water, running obliquely toward the surface of the ground. From these they emerge, when necessity requires, to obtain food. They do not seem to set much value on life, and are easily caught by the hunters and trappers.

The drug called *castoreum*, and which is an unctuous substance, of a strong, musky odor, is obtained from two glandular sacks, situated near the anus. On this subject Richardson says: "I have not had an opportunity of dissecting a beaver, but I was informed by the hunters that both males and females are furnished with one pair of little bags containing castoreum, and also with a second pair of smaller ones betwixt the former and the anus, which are filled with a white fatty matter, of the consistence of butter, and exhaling a strong odor. This latter substance is not an article of trade; but the Indians occasionally eat it, and also mingle a little with their tobacco when they smoke. I did not learn the purpose that this secretion is destined to serve in the economy of the animal; but from the circumstance of small ponds, when inhabited by beavers, being tainted with its peculiar odor, it seems probable that it affords a dressing to the fur of these aquatic animals. The castoreum in its recent state is of an orange-color, which deepens, as it dries, into bright reddish-brown. During the drying, which is allowed to go on in the shade, a gummy matter exudes through the sack, which the Indians delight in eating. The male and fe-

male castoreum is of the same value, ten pairs of bags of either kind being reckoned to an Indian as equal to one beaver-skin. The castoreum is never adulterated in the fur countries."

It appears that the castoreum, which is called *bark-stone* by the traders, is used by the hunters in baiting their traps, because the beavers are exceedingly fond of the odor. The end of a small stick, chewed or crushed, is dipped in the castoreum, which is kept in a horn; it is then set in the water, with the anointed end above the surface, and the trap beneath. The beavers scent the castoreum for a hundred yards or more, and so much are they delighted, that they draw in a long breath, and utter a cry of joy as they imbibe the delicious fragrance. On approaching the delusive bait, they are caught in the trap.

The traveler we have just quoted gives the following account of the flesh, which, as much has been said of its delicacy as food, is interesting: "The flesh of the beaver is much prized by the Indians and Canadian Voyagers, especially when it is roasted in the skin, after the hair has been singed off. In some districts it requires all the influence of the fur-trader to restrain the hunters from sacrificing a considerable quantity of beaver fur every year to secure the enjoyment of this luxury; and Indians of note have generally one or two feasts in the season, wherein a roasted beaver is the prime dish. It resembles pork in its flavor, but the lean is dark-colored, the fat oily, and it requires a strong stomach to sustain a full meal of it. The tail, which is considered a great luxury, consists of a gristly kind of fat, as rich, but not so nauseating, as the fat of the body."

Of the sagacity, ingenuity, and social polity of this animal many wonderful tales have been told; except its instinct of building, however, it is not distinguished for intelligence. The following excellent account, by Hearne, the traveler in North America, though it dissipates these fictions, presents many curious and interesting details. "The beaver," he says, "being so plentiful, the attention of my companions was chiefly engaged on them, as they not only furnished delicious food, but their skins proved a valuable acquisition, being a principal article of trade, as well as a serviceable one for clothing. The situation of the beaver-houses is various. Where the beavers are numerous, they are found to inhabit lakes, ponds, and rivers, as well as those narrow creeks which connect the numerous lakes with which this country abounds; but the two latter are generally chosen by them when the depth of water, and other circumstances, are suitable, as they have then the advantage of a current to convey wood and other necessaries to their habitations, and because, in general, they are more difficult to be taken than those that are built in standing water. They always choose those parts that have such a depth of water as will resist the frost in winter, and prevent it from freezing to the bottom. The beavers that build their houses in small rivers or creeks, in which water is liable to be drained off when the back supplies are dried up by the frost, are wonderfully taught by instinct to provide against that evil by making a dam quite across the river, at a convenient distance from their houses.

"The beaver-dams differ in shape according to the nature of the place in which they are built. If the water in the river or creek have but little motion, the dam is almost straight; but when the current is more rapid, it is always made with a considerable curve, convex toward the stream. The materials made use of are drift-wood, green willows, birch, and poplars, if they can be got; also, mud and stones, intermixed in such a manner as must evidently contribute to the strength of the dam; but there is no other order or method observed in the dams, except that of the work being carried on with a regular sweep, and all the parts being made of equal strength. In places which have been long frequented by beavers undisturbed, their dams, by frequent repairing, become a solid bank, capable of resisting a great force, both of water and ice; and as the willow, poplar, and birch generally take root and shoot up, they by degrees form a kind of regular planted hedge, which I have seen in some places so tall that birds built their nests among the branches.

"The beaver-houses are built of the same materials as the dams, and are always proportioned in size to the number of inhabitants, which seldom exceeds four old, and six or eight young ones; though by chance I have seen above double the number. Instead of order or regulation being observed in rearing their houses, they are of a much ruder structure than their dams; for, notwithstanding the sagacity of these animals, it has never been observed that they aim at any other convenience in their houses than to have a dry place to lie on: and there they usually eat their

victuals, which they occasionally take out of the water. It frequently happens that some of the large houses are found to have one or more partitions, if they deserve that appellation, but it is no more than a part of the main building, left by the sagacity of the beaver to support the roof. On such occasions, it is common for those different apartments, as some are pleased to call them, to have no communication with each other but by water; so that, in fact, they may be called double or treble houses, rather than different apartments of the same house. I have seen a large beaver-house built in a small island that had near a dozen apartments under one roof; and, two or three of these excepted, none of them had any communication with each other but by water. As there were beavers enough to inhabit each apartment, it is more than probable that each family knew their own, and always entered at their own doors, without any further connection with their neighbors than a friendly intercourse, and to join their united labors in erecting their separate habitations, and building their dams where required.

"So far are the beavers from driving stakes into the ground when building their houses, as has been asserted, that they lay most of the wood crosswise, and nearly horizontal, and without any other order than that of leaving a hollow or cavity in the middle. When any unnecessary branches project inward, they cut them off with their teeth and throw them in among the rest, to prevent the mud from falling through the roof. It is a mistaken notion that the wood-work is first completed and then plastered; for the whole of their houses, as well as their dams, are, from the foundation, one mass of mud and wood, mixed with stones, if they can be procured. The mud is always taken from the edge of the bank, or the bottom of the creek or pond near the door of the house; and though their fore-paws are so small, yet it is held close up between them under their throat; thus they carry both mud and stones, while they always drag the wood with their teeth. All their work is executed in the night, and they are so expeditious, that in the course of one night I have known them to have collected as much as amounted to some thousands of their little handfuls. It is a great piece of policy in these animals to cover the outside of their houses every fall with fresh mud, and as late as possible in the autumn, even when the frost becomes pretty severe, as by this means it soon freezes as hard as a stone, and prevents their common enemy, the wolverene, from disturbing them during the winter; and as they are frequently seen to walk over their work, and sometimes to give a flap with their tail, particularly when plunging into the water, this has, without doubt, given rise to the vulgar opinion that they use their tails as a trowel with which they plaster their houses; whereas, that flapping of the tail is no more than a custom which they always preserve, even when they become tame and domestic, and more particularly so when they are startled.

"Their food consists largely of the root of the common yellow water-lily. They also eat the bark of trees, particularly those of the poplar, birch, and willow; but the ice preventing them from getting to the land in the winter, they have not any bark to feed on in that season, except that of such sticks as they cut down in summer, and throw into the water opposite the doors of their houses, and as they generally eat a great deal, the roots above mentioned constitute a principal part of their food during the winter. In summer they vary their diet by eating various kinds of herbage, and such berries as grow near their haunts during that season. When the ice breaks up in the spring, the beavers always leave their houses, and rove about until a little before the fall of the leaf, when they return again to their old habitations, and lay in their winter stock of wood. They seldom begin to repair their houses till the frost commences, and never finish the outer coat till the cold is pretty severe, as has been already mentioned. When they erect a new habitation, they begin felling the wood early in the summer, but seldom begin to build until the middle or latter end of August, and never complete it till the cold weather be set in.

"Persons who attempt to take beaver in winter should be thoroughly acquainted with their manner of life, otherwise they will have endless trouble to effect their purpose, because they have always a number of holes in the banks, which serve them as places of retreat when any injury is offered to their houses, and in general it is in those holes that they are taken. When the beavers which are situated in a small river or creek are to be taken, the Indians sometimes find it necessary to stake the river across, to prevent them from passing; after which, they endeavor to find out all their holes or places of retreat in the banks. This requires much practice and experience

to accomplish, and is performed in the following manner: every man being furnished with an ice-chisel, lashes it to the end of a small staff about four or five feet long; he then walks along the edge of the banks, and keeps knocking his chisel against the ice. Those who are acquainted with that kind of work well know by the sound of the ice when they are opposite to any of the beavers' holes or vaults. As soon as they suspect any, they cut a hole through the ice big enough to admit an old beaver, and in this manner proceed till they have found out all their places of retreat, or at least as many of them as possible. While the principal men are thus employed, some of the understrappers and the women are busy in breaking open the house, which at times is no easy task, for I have frequently known these houses to be five or six feet thick, and one in particular was more than eight feet thick in the crown. When the beavers find that their habitations are invaded, they fly to their holes in the banks for shelter; and on being perceived by the Indians, which is easily done by attending to the motion of the water, they block up the entrance with stakes of wood, and then haul the beaver out of its hole, either by hand, if they can reach it, or with a large hook made for that purpose, which is fastened to the end of a long stick.

"In this kind of hunting, every man has the sole right to all the beavers caught by him in the holes or vaults; and as this is a constant rule, each person takes care to mark such as he discovers by sticking up a branch of a tree, by which he may know them. All that are caught in the house are the property of the person who finds it. The beaver is an animal which cannot keep under water long at a time, so that, when their houses are broken open, and all their places of retreat discovered, they have but one choice left, as it may be called, either to be taken in their house or their vaults; in general, they prefer the latter, for where there is one beaver caught in the house, many thousand are taken in the vaults in the banks. Sometimes they are caught in nets, and in summer very frequently in traps.

"In respect to the beavers dunging in their houses, as some persons assert, it is quite wrong, as they always plunge into the water to do it. I am the better enabled to make this assertion from having kept several of them till they became so domesticated as to answer to their name, and follow those to whom they were accustomed in the same manner as a dog would do, and they were as much pleased at being fondled as any animal I ever saw. In cold weather they were kept in my own sitting-room, where they were the constant companions of the Indian women and children, and were so fond of their company, that when the Indians were absent for any considerable time the beaver discovered great signs of uneasiness, and on their return showed equal marks of pleasure by fondling on them, crawling into their laps, lying on their backs, sitting erect like a squirrel, and behaving like children who see their parents but seldom. In general, during the winter, they lived on the same food as the women did, and were remarkably fond of rice and plum-pudding; they would eat partridges and fresh venison very freely, but I never tried them with fish, though I have heard they will at times prey on them. In fact, there are few graminivorous animals that may not be brought to be carnivorous."

Of the habits of the beaver in a state of confinement, M. Broderip furnishes us with the following interesting account, relating to one taken to London some years ago:

"The animal arrived in England in the winter of 1825, when very young, being small and woolly, and without the covering of long hair which marks the adult beaver. It was the sole survivor of five or six which were shipped at the same time, and it was in a very pitiable condition. Good treatment quickly restored it to health, and kindness soon made it familiar. When called by its name, 'Binny,' it generally answered with a little cry, and came to its owner. The hearth-rug was its favorite haunt, and thereon it would lie stretched out, sometimes on its back, sometimes on its side, and sometimes flat on its belly, but always near its master.

"The building instinct showed itself immediately it was let out of its cage, and materials were placed in its way; and this before it had been a week in its new quarters. Its strength, even before it was half-grown, was great. It would drag along a large sweeping-brush or a warming-pan, grasping the handle with its teeth, so that the load came over its shoulder, and advancing in an oblique direction till it arrived at the point where it wished to place it. The long and large materials were always taken first, and two of the longest were generally laid crosswise, with one of the ends of each touching the wall, and the other ends projecting out into the room. The

area, formed by the crossed brushes and the wall, he would fill up with hand-brushes, rush-baskets, books, boots, sticks, clothes, dried turf, or any thing portable.

"As the work grew high, he supported himself upon his tail, which propped him up admirably, and he would often, after laying on one of his building materials, sit up over against it, appearing to consider his work, or as the country people say, 'judge it.' This pause was sometimes followed by changing the position of the material 'judged,' and sometimes it was left in its place. After he had piled up his materials in one part of the room, for he generally chose the same place, he proceeded to wall up the space between the feet of a chest of drawers which stood at a little distance from it, high enough on its legs to make the bottom a roof for him, using for this purpose dried turf and sticks, which he laid very even, and filling up the interstices with bits of coal, hay, cloth, or any thing he could pick up. This last place he seemed to appropriate for his dwelling; the former work seemed to be intended as a dam.

"When he had walled up the space between the feet of the chest of drawers, he proceeded to carry in sticks, clothes, hay, and cotton, and to make a nest, and when he had done, he would sit up under the drawers and comb himself with the nails of his hind-feet. In this operation, that which appeared at first to be a malformation was shown to be a beautiful adaptation to the necessities of the animal. The huge webbed hind-feet of the beaver turn in so as to give the appearance of deformity; but if the toes were straight, instead of being incurved, the animal could not use them for the purpose of keeping its fur in order, and cleansing it from dirt and moisture.

"Binny generally carried small and light articles between his right fore-leg and his chin, walking on the other three legs; large masses, which he could not grasp readily with his teeth, he pushed forward, leaning against them with his right fore-paw and his chin. He never carried any thing on his tail, which he liked to dip in water, but he was not fond of plunging in the whole of his body. If his tail was kept moist, he never cared to drink; but if it was kept dry, it became hot, and the animal appeared distressed, and would drink a great deal. It is not impossible that the tail may have the power of absorbing water like the skin of frogs, though it must be owned that the scaly integument which invests that member has not much of the character which generally belongs to absorbing surfaces.

"Bread, milk, and sugar formed the principal part of Binny's food, but he was very fond of succulent fruits and roots. He was a most entertaining creature, and some highly comic scenes occurred between the worthy but slow beaver, and a light and airy macauco that was kept in the same apartment."

The history of the beaver, in connection with man, is a tale of persecution and destruction for twenty centuries or more, without the mitigation, as in the case of domestic animals, of services rendered in its behalf. The beaver is everywhere a wild animal, and yet entirely inoffensive, offering no provocation by attacking either the life, comfort, or industry of man. But it offers the extraordinary temptations of edible flesh, a precious drug, and an almost priceless pelt! Formerly, it built its villages in all the north of Europe, in the same manner, and doubtless in as great numbers, as in North America. It was then the gentle, ingenuous, thrifty possessor of the banks of rivers, and streams, and lakes, and ponds, in the boundless wilds yet unknown to man. How secure, how ample its dominions then; how narrow its tenements, how persecuted its existence now! Wherever it may be every man's hand is raised against it. Hunters and trappers pursue it to its most hidden retreats; every crafty device is employed for its capture. If it lingers yet in its old haunts—possessed in fee by its ancestors for thousands of years—now in the vicinity of human settlements, it is as a timid, trembling, and almost solitary fugitive, venturing abroad only at night, and then with the consciousness that every step is taken in peril of its life.

It has been made a matter of question whether the European beaver is of the same species as the American. It is said that along the Rhine, Danube, and other rivers of Europe, it does not associate and build huts as in America, but lives in burrows, like the musk-rat. There can be no doubt, that being greatly reduced in numbers, and annoyed by the vicinity of man—whose cultivation comes to the doors of its retreat—it has in some degree changed its natural habits. Pinkerton gives the following translation from a Swedish writer of 1767, describing the beaver of the

north of Europe, by which—though the account is no doubt exaggerated—it appears that in their chief peculiarity they there display the same instincts as their American congeners:

"The beaver is instinctively led to build his house near the banks of lakes and rivers. He saws with his teeth birch-trees, with which the building is constructed; with his teeth he drags the wood along to the place destined for building his habitation; in this manner one piece of timber is carried after another where they choose. At the lake or river, where their house is to be built, they lay birch-stocks or trunks, covered with their bark, in the bottom itself, and forming a foundation, they complete the rest of the building with so much art and ingenuity as to excite the admiration of the beholders. The house itself is of a round and arched figure, equaling in its circumference the ordinary hut of a Laplander. In this house the floor is for a bed, covered with branches of trees, not in the very bottom, but a little above, near the edge of a river or lake; so that, between the foundation and flooring, on which the dwelling is supported, there is formed, as it were, a cell, filled with water, in which the stalks of the birch-tree are put up; on the bark of this, the beaver family who inhabit this mansion feed. If there are more families under one roof, besides the laid flooring, another, resembling the former, is built a little above, which you may not improperly name a second story in the building. The roof of the dwelling consists of branches very closely compacted, and projects out far over the water. You have now, reader, a house consisting and laid out in a cellar, a flooring, a hypocaust, a ceiling, and a roof, raised by a brute animal, altogether destitute of reason, and also of the builder's art, with no less ingenuity than commodiousness."

In confirmation of the preceding description—or at least in evidence of the building propensity of the European beaver—we copy the following anecdote, related by Geoffroy St. Hilaire: "One of these beavers from the Rhône was confined in the Paris menagerie. Fresh branches were regularly put into his cage, together with his food, consisting of vegetables, fruits, &c., to amuse him during the night, and minister to his gnawing propensity. He had only litter to shield him from the frost, and the door of his cage closed badly. One bitter winter-night it snowed, and the snow had collected in one corner. These were all his materials, and the poor beaver disposed of them to secure himself from the nipping air. The branches he interwove between the bars of his cage, precisely as a basket-maker would have done. In the intervals he placed his litter, his carrots, his apples, his all, fashioning each with his teeth so as to fit them to the spaces to be filled. To stop the interstices he covered the whole with snow, which froze in the night, and in the morning it was found that he had thus built a wall which occupied two-thirds of the doorway."

While the beaver has thus been exterminated in Europe, except that a few linger along the borders of the rivers in the more thinly settled portions, and somewhat greater numbers exist in the forests of the north, in North America a similar process has been going on. Where, half a century ago, a hunter or trapper could kill four hundred in a year, they are already scarce, and are only to be found in sufficient numbers to make the pursuit a profession in the distant solitudes of the northwest. It was formerly spread over the whole of North America, and as appears, was so plentiful even in what constitutes the present State of New York, that two centuries ago, from eight to ten thousand skins were annually taken. The trade in beaver-skins was, indeed, one of the leading inducements to the early settlements and migrations of the colonists, English and French. Catesby speaks of it as found in Carolina, and Bartram in Florida; and the names of Beaver River, Beaver Creek, Beaver Dam, all over the country, show the universality of its distribution throughout the whole United States. A few are still found in remote and unsettled parts as far south as Virginia, and thence northward through most of the Middle and Eastern States. In the Canadas, where it was once so abundant, it is rare, and is only plentiful in the vast wilds of the northwest—its range extending across the continent, and as high as 68° north latitude—the hunting-grounds of the Indians. Here there are still men who pursue the life of hunters and trappers, but while they are exposed to many hardships, and to the dangerous hostility or fatal caprice of the Indians, they rarely obtain a compensation, and never a fortune. Formerly, a skillful trapper obtained eighty beavers in the autumn, sixty in the spring, and three hundred in the summer, but less than half that number is now the usual fruit of a season's labor. The Indians are the chief pursuers of this, as well as the other fur-bearing animals of the North

and West at the present time, their peltry being chiefly collected by the agents of the Hudson's Bay Company.

In Europe, the beaver-skin was used for clothing as far back as the age of Herodotus. The existence of the beaver in England is indicated as early as the time of Alfred the Great, who speaks in his writings of its curious building instincts. In 1638, Charles I. issued a proclamation prohibiting the use of any materials except *beaver-stuff* or *beaver-wool* in the manufacture of hats, and forbidding the making of the hats called *demi-castors*, unless for exportation. This proclamation was an almost exterminating death-warrant to the beavers in the American Colonies. They were speedily swept away from the more southern ones, and the traffic became for the most part confined to Canada and Hudson's Bay. From this time the imports into Europe appear to have varied from 100,000 to 150,000 skins a year. London became the great market for these furs, and the average importations from 1783 to 1840 were about 140,000. The annual consumption of the whole world probably did not exceed 150,000.*

* Statistics of the Fur Trade.—Since the above was written, we have taken some pains to collect facts on this subject, and by the kindness of one of the leading American houses in New York connected with this business, with other opportunities, we are able to offer the following interesting facts:

IMPORTATION OF FURS OF THE HUDSON'S BAY COMPANY IN 1858, AND OFFERED FOR SALE IN LONDON IN JANUARY AND MARCH, 1859.

Kinds of skins.	No. of skins.	Total 1858.	Total 1857.	Total 1856.	Value in 1859.	Kinds of skins.	No. of skins.	Total 1858.	Total 1857.	Total 1856.	Value in 1859.
Beaver.....	Collected from various sources.	72,241	67,644	61,789	$1 25 per lb.	Martin.....	Collected from various sources.	108,752	110,848	144,235	$2 50 each.
Badger.....		1,285	1,090	785	0 60 each.	Mink.....		40,336	43,318	40,368	1 27 each.
Bear.....		3,566	3,199	3,796	7 00 each.	Musquash...		219,829	290,112	280,517	0 14 each.
Fisher.....		5,168	4,886	4,885	6 00 each.	Otter.....		9,968	9,822	8,958	4 50 each.
Fox—Silver.		894	826	780	25 00 each.	Rabbit.....		54,516	60,929	70,626	3 *a* 4c. each.
" Cross..		3,307	2,718	2,637	7 00 each.	Skunk.....		8,460	8,124	———	1 50 each.
" Red....		10,295	8,851	9,644	1 25 each.	Swan skins..		829	775	———	0 25 each.
" White.		1,542	2,158	3,354	0 60 each.	Wolf.....		12,007	6,789	8,720	1 50 each.
" Kitt...		5,546	9,811	5,668	0 35 each.	Wolverine..		697	648	617	2 00 each.
Lynx.....		28,102	26,794	18,907	2 40 each.						

This does not embrace the Columbia River importation, which includes about 18,000 beaver-skins annually; and of the other kinds, about fifteen per cent. on the preceding numbers.

On the 26th of January, 1859, C. M. Lampson & Co., an American house in London, offered for sale 10,000 beaver-skins and 350,000 musquash skins, and in March, the following:

200,000 Raccoon-skins.
200 Cross and Silver Fox-skins.
1,000 Lynx-skins.
1,000 Skunk-skins.
5,000 Mink-skins.
2,000 Martin-skins.
1,000 Bear-skins.
10,000 Opossum-skins.
10,000 Red Fox-skins.
1,000 Otter-skins.
700 Fisher-skins.

This is a half-yearly sale, so that the numbers must be doubled. These tables furnish the elements of a calculation of the furs of the above kinds, annually imported into London from America, for these two concerns engross the entire trade. To these must be added the furs retained in the United States for consumption there. The amount of the European and Asiatic furs of these kinds is trifling in comparison with the preceding amounts.

The whole number of beaver-skins annually produced can thus be pretty accurately ascertained. The importation of the Hudson's Bay Company alone, for 1858, is 72,241 skins; for Columbia River, 18,000; Lampson & Co. sell 20,000; retained for use in the United States, 5,000; and the Russian America skins sent to the United States and used there, 4,000. Thus we have 119,241 beaver-skins as the product of North America for the year 1858. This exceeds the average; the product throughout the world may be one hundred thousand skins annually. Owing to the substitution, for the manufacture of hats, of silk and Nutria fur—the skins of this animal selling at forty cents the pound, (see page 408,)—the demand for beaver has greatly diminished within the last ten years, and the present annual product is but about two-thirds what it was formerly. The price was $7 a pound in 1832, in 1844 $4 50; it is now $1 25. This reduction of value has abated the zeal with which these animals have been pursued, and it is a curious fact that in some localities, especially in British America, they are actually on the increase. Within the United States, the Indians, having ceded their lands to the government, and receiving annual stipends from the same, have greatly relaxed their energy and enterprise in hunting and trapping; but the extending settlements of the whites have even more than supplied their place, as the white man pursues wild animals from the spirit of the chase, without exclusive regard to the money profits they may yield. The beaver territory is much more contracted than it was. Twenty years ago Kansas and Nebraska produced a considerable amount of beavers; at present their yield is trifling. In 1830 the Lake Superior Indians annually procured furs to the value of $150,000; now the annual product of the same region is not more than one-fifth of that value. All things considered, we think the beaver at the present time is actually diminishing, though, as we have said, in certain places it may be on the increase. It must be remembered that about 100,000 are annually killed, almost wholly in North America, and that in a territory very much contracted from what it was half a century ago, when the annual product was 150,000.

The musquash-skins are chiefly supplied from the U. S.; Lampson & Co.'s sales are about a million a year.



THE HYSTRICIDÆ.

This family embraces a number of tribes, all bearing more or less resemblance to the well-known *Porcupine*, whose scientific name is *Hystrix*, and thus furnishes the title of the group. Most of these have some resemblance to the hog, from the nature of their hair, the form of their body, and their manner of walking, as well as in some less important particulars. Their size, though less than that of the hog, is still superior to most other rodents. They all have four pair of molar teeth, the crowns of which exhibit sinuosities more or less complicated. The cranium and jaws also present some peculiarities. The tribes included in this family we shall notice under the names of *Caviens*, *Celogenyens*, *Dasyproctiens*, *Hystriciens*, *Aulacodiens*, *Erethizoniens*, *Chinchilliens* or *Callomyens*, and *Anomaluriens*.

THE CAVIENS OR CAVIINA.

This tribe has the following characteristics: molar teeth rootless, divided by folds of enamel so as to form lobes having acute angles; the series of molars on opposite sides of the upper jaw converging, and nearly meeting in front; incisor teeth comparatively short, those of the lower jaw not being extended backward as far as the springing of the angular portion, or descending ramus; four toes to the fore-feet, and three to the hind; tail wanting, or rudimentary; upper lip entire; a strongly-developed horizontal ridge on the outer surface of the lower jaw; the angular portion of this jaw produced much beyond the condyloid portion, descending below the level of the dental portion, and with a curved lower margin; clavicles wanting.



THE CAPYBARA.

Genus HYDROCHERUS: *Hydrochœrus.*—Of this there is a single species, the CAPYBARA, *H. capybara*, which has had the various designations of *Water-hog*, *Tailless Hippopotamus*, and *Short-nosed Tapir:* it is called *Cabiai* by the French. It measures at least three feet from the muzzle to the hinder part, and has no tail. The general shape of the body is thick, and, as one would say, pig-like; but the head is that of rodent animals generally, and like the rest of these, the upper lip is furnished with mustaches. The hairs on the upper part of the head and body, and the outsides of the legs, are black at the roots, and also at the points, while the intermediate part is yellow. The insides of the legs, a portion of the under part, and also round the eyes, is entirely yellow and the mustaches are black. The mixture of these two colors gives a dinginess to the animal, and its expression at the same time is rather dull and heavy. The hair is also somewhat bristly in its texture, and sparely scattered over the body of the animal; and this increases its pig-like appearance; the ears are small and rounded. The female has twelve mammæ, which are situated partly on the breast and partly on the belly; the upper lip is divided, though not so much as in the hare, but still in the closed mouth it shows the teeth partially; the eyes are large, and of a black color; the nose, the ears, and the naked portion of the legs, are blackish ash-color. The color of the hair changes with age, and in very old specimens the root is black, the middle brown, and the point red. In consequence of these changes, which are in general attended with an increase of size, several varieties have sometimes been described, but there is every reason to believe that there is only one species.

The capybara is found in the neighborhood of the great rivers of Guiana, Brazil, and Paraguay. It feeds on fruits and herbs, is nocturnal in its habits, wanders about in large droves making a loud clamor, swims rivers and torrents in search of food, sometimes catches and eats fish, and is killed in large numbers by the hunters. Its flesh is oily and of a fishy flavor, on which account it is permitted by some Catholics on meagre days; the head is considered a delicacy; indeed, the whole animal is eaten and relished by some of the South Americans. The capybaras are easily tamed, and become gentle in confinement, coming at call, and following those who serve them; but their dull appearance, slow motions, aquatic habits, and an offensive odor which they emit, prevent their becoming favorites.

Genus DOLICHOTIS: *Dolichotis.*—Of this there is one species, the PATAGONIAN CAVY, *D. Patagonica.* This is a burrowing animal, but sometimes avails itself of the excavations of the



THE PATAGONIAN CAVY.

viscacha for a retreat. It wanders at times to great distances from its home; on these occasions, two or three are usually seen together. The animal in its mode of running greatly resembles the rabbit, but though its limbs are long it does not run very fast; it sometimes, though seldom, squats after the manner of the hare, is very shy and watchful, and feeds by day. The eyes, like those of the Kangaroos, are defended from the direct rays of the sun by well-developed eye-lashes, which is not the case with ordinary cavies. It generally produces two young at a birth, and brings forth in its burrow; its flesh is white when cooked, but rather dry and tasteless. The long legs and rather long erect ears, combined with the general form of the head, and the short recurved tail, have caused this animal to be very generally mistaken for a hare by casual observers. Its fur is soft, and its color brown on the back and fawn on the sides. For size it surpasses the common hare, full-grown individuals weighing from twenty to thirty pounds, and indeed the Patagonian Cavy must rank among the largest of the rodent tribe, though surpassed by its aquatic congener, the capybara.

It is found in Patagonia on the east coast, from latitude 37° to 48° south. Darwin says it "is found only where the country has a desert character. It is a common feature in the landscape of Patagonia to see in the distance two or three of these Cavies hopping one after the other in a straight line over the gravelly plains thinly clothed by a few thorny bushes and a withered herbage."

Genus KERODON: *Kerodon.*—Of this there is a single species, the Rock Cavy, *K. rupestris*, the *Kerodon Moco* of F. Cuvier. In this animal the fur is soft, its general hue gray, tinted with rufous on the hinder part of the back; throat white, chest whitish; abdomen white, suffused with pale ocherous yellow. It inhabits the interior of Brazil, and is confined to rocky districts, where it seeks its retreat in holes among the fragments of the rocks. It is frequently met with at Belmonte, Rio Pardo, and Rio de St. Francisco, being found near the rivers, but always in the higher parts of their course. Its flesh is said to be well-flavored, on which account it is sought by the Indians, to whom it is known by the name of *Hokê;* by the Portuguese it is called *Mokô.* It is superior in size to most other cavies, stands higher on its legs, and is remarkable in its group for the comparative softness of its fur, and the structure of the nails of its toes.

Genus CAVIA: *Cavia*, or COBAYE, according to Gervais.—Of this there are several species, all called *Cavies*, the most noted of which is the Restless Cavy, *C. aperea*; the *Cochon d'Inde*



THE ROCK CAVY.

of Buffon; the *Ferkel-maus* of the Germans. It is sometimes called *Coui-coui*, from its cry. There is both a wild and a domestic breed. In a wild state, it has the incisors white; fur long, and somewhat coarse, and on the upper parts of the sides and body distinctly penciled with black and dirty yellow; chest gray-brown, throat and abdomen pale, dirty yellow, or sometimes brown-gray. It is of the size of a large rat, its legs very short, its neck short, and its body very clumsy. It has no tail. It inhabits the banks of the Rio de la Plata, and extends northward into Paraguay, Bolivia, and Brazil. It is known by the name of *Aperea*, and it is exceedingly common in the neighborhood of several towns on the banks of the Rio de la Plata, sometimes frequenting the sand hillocks, or the hedge-rows formed of the *Agave* and *Opuntia;* but marshy places, covered with aquatic plants, appear to be preferred.

Where the soil is dry, it makes a burrow, but otherwise lies concealed amid the herbage. It generally comes out to feed in the evening, and if the day be gloomy, it will likewise make its appearance in the morning. Mr. Bridges states that this animal in Bolivia is confined to the low lands, and in this respect differs from the *Cavia Boliviensis*, which is always found at a considerable elevation. It is not uncommon in fields in the neighborhood of Chuquisaca and Cochabamba, and takes shelter among the loose stones of the walls by which the fields are inclosed. In Paraguay it generally frequents moist situations, and near the borders of forests, but it never occurs either in the forests or in the open fields. It lives in little societies of from six to fifteen individuals, in the impenetrable groves of bromelias, and its presence is detected by numerous little beaten paths which it forms among these plants. It feeds early in the morning and after sunset in the evening, but never strays far from its home. It is stated that it breeds but once in the year, and then has but one or two young.

The Domestic Guinea-Pig, or Cobaya, or Anœma, the *Mus porcellus* of Linnæus, is probably the descendant of the wild species just described, though this some naturalists doubt, as the *Aperea* is said to breed but once a year, and to produce only one or two at a time, while the domestic animal is prolific as a rabbit; the color, also, of the tame variety is greatly diversified. In



INDIAN CATCHING A WILD GUINEA-PIG.

reply, it may be said that some doubt rests upon the facts as to the breeding of the *Aperea*, and even if its habits vary from those of the *Cobaya*, it may be that a change of life has produced this alteration. The change of color is analogous to the changes in various other domestic animals.

Before we proceed to describe this animal, we may note the inaccuracy of its popular title, *Guinea-Pig;* it is not from *Guinea*, neither is it a *pig*. Perhaps *Guinea* was mistaken for *Guiana*, from which country it is possible the creature was first introduced into Europe; the name of *pig* may be forgiven, as the creature certainly somewhat resembles a very small denizen of the sty.

Among the domestic Guinea-pigs, some are almost entirely white, others spotted with black and fawn-color, with yellow, tawny, &c. The body is short and thick; the neck is not distinguishable from the head and trunk; the ears, which are large, naked, and transparent, are in a great measure concealed by the hairs on the upper part of the head; the eyes are round, large, and prominent; the head and nose resemble those of the hare and rabbit; the teeth are similar to those of the rat, but they are placed obliquely outward in the upper, and obliquely inward in the lower jaw; and the hair is long, hard and smooth.

Among the most remarkable of the characters of this animal may be recorded its precocity and fertility; for though it attains not its full growth till eight or nine months, it is capable of propagating in five or six weeks after birth. The female goes only three weeks with young; her first litter consists of two, which corresponds with the habit of the wild species; her second of four or five, and her subsequent ones of seven or eight, or even sometimes of ten or eleven. It is curious that the mother has but two mammæ. She gives suck only for twelve or fifteen days, and chases away her young if they remain longer by her, or, if they prove refractory, she permits the male to abuse and kill them. Her parental attachment, indeed, seems to be much weaker than in most other species; for she will often suffer her young to be taken from her, and even devoured



GUINEA-PIGS.

as soon as they are born, without betraying the least concern. As she breeds once in the two months, it has been calculated that a single couple may prove the source of one thousand individuals in the course of a year. To check this excessive fecundity, nature has provided that many of them should fall a sacrifice to cold and moisture, to the feeble and short-lived affection of their parents, to their quarrels with one another, and to their incapacity of defending themselves against cats and other beasts of prey. Their life is almost an incessant round of eating, sleeping, and reproducing their kind.

Buffon asserts that they never drink, but this not correct, for they are very fond of milk, and, in default of it, have recourse to water. They readily feed on all sorts of herbs, but prefer parsley and the tops of carrots even to bread or flour. They are also very fond of apples and other fruits, and will feed on grain, and tea-leaves. They eat precipitately, like rabbits, and very often, and but little at a time. They sleep with their eyes half open, like the hare, and continue watchful if apprehensive of danger. Their usual cry resembles the grunting of a young pig; but they also express pleasure or pain by appropriate sounds. They are very susceptible to cold, and will press together to avoid its effects. Though naturally tame and gentle in their deportment, they are incapable of strong attachment. They seem to be governed by instinct, and to have less of what may be called intelligence than almost any other rodent. They love dark and intricate retreats, and seldom venture out of concealment when danger is at hand. They are at great pains to keep themselves and one another clean, frequently licking and smoothing their own and their neighbors' fur.

With scarcely sufficient courage to defend themselves against the attacks of a mouse, their animosities against those of their own species are obstinate and violent, and generally originate in a desire of possessing the warmest corner, or the most agreeable food. The males also have sharp conflicts of gallantry. Their mode of fighting is very singular, for one of them seizing the neck of its antagonist with its teeth, attempts to tear off the hair, while the other turns its posteriors to the aggressor, kicks up behind like a horse, and scratches his rival's flanks even to the effusion of blood. The only battles which they fight are, however, with one another; for they may be taken, and even killed, without offering any resistance, farther than very feeble attempts at escape.

These animals are not eaten, and the chief reason for their being propagated, as they are to a considerable extent, is, that they are exceedingly smooth, gentle, and pretty, are very productive, and easily kept. They have a disagreeable smell, but this is supposed to be compensated for by disgusting rats and mice so that they will desert the place which they inhabit.

The other species of Cavia are as follows: Spix's Cavy, *C. Spixii*, and the Brilliant Cavy, *C. fulgida*, both of Mexico; the Yellow-toothed Cavy, *C. flavidens*, of Bolivia, found abundantly in the plains around Lake Titicaca, and called *C. Boliviensis* by some authors, and *Galea musteloides* by Meyen; Cutler's Cavy, *C. Cutleri*, of Peru, and the Southern Cavy, *C. Australis*, found from Paraguay to the Straits of Magellan. This latter is described as living in deep burrows, made in sandy places covered with shrubs, and usually near the habitations of man. It is lively, but timid, seldom quitting its retreats, except at night. The Indians call it *Sahal*, and the Spaniards *Tucu-tucu*. Bennett gives this species the scientific name of *Kerodon Kingii*.



THE BROWN PACA.

THE CELOGENYENS OR PACAS.

The Pacas resemble the capybaras, though the former are omnivorous and the latter herbivorous; they also approach the agoutis, being closely allied to them by their general form and the similarity of their organization. The dental and generative systems in both are very nearly alike; neither have clavicles, nor indeed has the capybara; and though the agouti has only three toes on the hind-feet, the two additional hind-toes of the Paca are hardly more than rudiments. The great differences consist in the zygomatic development, the folding back of the skin under the zygomatic arch—and the consequent bluff appearance of the head—the cheek-pouches, and the fur.

Under this head we have to mention but the single genus, PACA or CELOGENYS, *Cœlogenys*, and a single species, the Paca, often called the Brown Paca; the *Spotted Cavy* of Pennant and Bewick; the *Pag* of the Brazilians; the *Paig* of the inhabitants of Paraguay. It is called *Pak* by the colonists of Cayenne, and *Water-hare* by those of Surinam. It is the *Mus paca* of Linnæus; the *C. subniger* of F. Cuvier. Some naturalists mention another species, *C. fulvus*, but it is doubtless only a variety of the *C. subniger*.

This animal, which is found in Brazil and the adjacent countries, and which once existed in the West Indies, has a thickset, stubby appearance, with a clumsy gait, though its movements are prompt and sudden. The fur is composed of silky hairs, very short, thin, and stiff, of a blackish-brown on all the upper parts of the body, excepting four rows of parallel spots, which begin at the shoulders and terminate at the haunches; the spots of each row are so approximated, that when viewed in a particular direction they seem to form an uninterrupted line, and the row nearest the belly is almost confounded with the color of that part, which is white; the under parts of the lower jaws, the internal surface of the limbs, and the claws are also white. The length of the body is twenty-one inches; the height, twelve inches.

In a state of nature the habitation of the Paca is in low humid forests, and in the neighborhood of water. The animal digs a burrow like the rabbit, but much less deep; indeed, it is so near the surface, that the foot of the pedestrian often breaks through, and, sinking into the tunnel, drives out the tenant. There are generally three issues to a burrow, and the apertures of these the animal covers with dry leaves and branches. To take it alive, the hunter stops two of these openings and digs into the third; but when the penetralia are reached, the hapless besieged makes a most determined resistance, fighting the enemy with ferocity, and trying to bite. When undisturbed, it often sits up and washes its head and whiskers with its two fore-paws, which it licks and moistens with its saliva at each ablution, like a cat; and with these fore-paws, as well as with the hind ones, it often scratches itself and dresses its fur. Though heavy and corpulent, it can run with a good deal of activity, and often takes lively jumps. It swims and dives with great adroitness, and its cry resembles the grunting of a young pig. Its food consists of fruits and tender plants, which it seeks in the night, hardly ever quitting its burrow in the day, the strong light of which, as is the case with other nocturnal animals, being oppressive to its eye. The planter often rues the visits made by these midnight foragers to his sugar-canes. The female is said to bring forth at the rainy season, and to produce but a single young one, which stays a long time with the mother. The Pacas are very cleanly creatures, never dropping their excrements near their dwellings, but going to a considerable distance for that purpose. The flesh is stated to be of good flavor, but as it is very fat and rich, it soon cloys; it is prepared for cooking by being scalded like a sucking-pig. Its skin is of no value to the furrier; but its thickness might make it available in the useful arts.

Cuvier thinks that this animal might be made to form a very good acquisition in the department of domestic economy. He had the opportunity of studying the habits of one in the Garden of Plants, and says that in captivity no creature can exhibit less intelligence. When offended, it throws itself violently at the object which has displeased it, and then makes a grumbling, which breaks out into a kind of barking; and when it is not eating it is sleeping. But it requires a soft and well-made bed, and, to obtain this, it collects with its mouth hay, herbage, straw, any thing, indeed, that suits its purpose, of which it makes a little heap, and then lies down in the center of it. This bed it never defiles, but goes to the extremity of its cage the farthest removed from it, and constantly resorts to the same spot for the same purpose. It feeds on vegetables, but does not refuse meat.

If the Paca is little favored on the side of intelligence, it appears on the other hand to be recompensed by a large share of instinct. Mr. Bennett, from his observation of one which lived for some months in the Garden of the Zoological Society, in London, states that it is quiet and contented in captivity. Buffon, who kept one for some time in his house, found it mild and familiar.

THE AGOUTIS, OR DASYPROCTIENS.

Of this tribe there is a single genus, AGOUTI: the *Dasyprocta* of Illiger, and *Chloromys* of Cuvier. The most prominent zoological characters of the species are found in the nature and conformation of the feet and toes. The toes are provided with powerful claws, and yet the animals make no use of them in digging or burrowing; they are pretty long, and separate from one another, enabling them to hold their food between their fore-paws, and in this manner to convey it to their mouth. Like all other animals which are thus accustomed to use the fore-paws as hands, they have a habit of sitting upright upon their hind-quarters to eat, and frequently also assume the same position when they would look around them, or are surprised by any unusual sound or occurrence. Their food is exclusively of a vegetable nature, and consists most commonly of wild yams, potatoes, and other tuberous roots; in the islands of the different West India groups they are particularly destructive to the sugar-cane, of the roots of which they are extremely fond. The planters employ every artifice for destroying them, so that at present they have become comparatively rare in the sugar islands, though on the first settlement of the Antilles and Bahamas they are said to have swarmed in such countless multitudes as to have constituted the principal article of food for the Indians. They were the largest quadrupeds indigenous to these islands



AGOUTIS.

upon their first discovery. The same rule of geographical distribution holds good generally in other cases, namely, that where groups of islands are detached at some distance from the main-land of a particular continent, the smaller species of inhabitants are usually found spread over both, while the larger and more bulky are confined to the main-land alone, and are never found to be indigenous in the small insulated lands.

Though the Agoutis use their fore-paws as hands to hold their food while they eat, yet their toes are nevertheless rigid and inflexible, and their claws large, blunt, and nearly straight. They are consequently deprived of the power of ascending trees; and as they also do not construct burrows, they wander at large among the woods, sheltering themselves beneath fallen timber, or in the hollow of some decayed tree. Here they produce and nurture their young, bringing forth, according to some accounts, three or four times in the year; according to others, never having more than a single litter in the same season, and even that consisting of not more than two or three individuals. It is probable, however, from the amazing number of these animals found in all the hotter parts of South America, notwithstanding the destruction made among them by small carnivorous animals, as well as by the Indians, and likewise from the close affinity which they bear to the hare and rabbit, that the Agoutis are tolerably prolific. The young are brought forth with their eyes closed, as in the case of most of the *Rodentia* and *Carnivora;* but they are covered with hair, or rather small bristles, of the same color as the mother; they soon acquire the use of their limbs, and learn to shift for themselves.

The hind-legs of the Agoutis are considerably longer than the fore, and their pace is tolerably rapid for a short distance. But they seldom trust to speed of foot for their safety, but seek for shelter and security in the first hollow tree, or under the first rock they meet with. Here they allow themselves to be captured, without any other complaint or resistance than the emission of a sharp, plaintive note. The head of the Agouti is large, the forehead and face convex, the nose swollen and tuberous, the ears round, short, and nearly naked, and the eyes large and black. The hair is annulated in different degrees with black, yellow, and green; it is generally coarse and bristly, like the weak spines of a hedge-hog, though in one species it approaches in fineness to the fur of the rabbit; the tail is most commonly a mere naked stump or tubercle, which in the Acouchy alone attains any apparent length, and is covered with a few short, scattered hairs. The teeth are twenty in all, namely, two incisors and eight molars, four on each side, in each jaw. Of this genus there are several species.

The Common Agouti, *D. acuti*, sometimes called the *Long-nosed* or *Yellow-rumped Cavy*, from its long nose and the prevalent color of its back and shoulders, is the size of a middling hare, being one foot eight inches in length, and about eleven or twelve inches high at the croup. The head resembles that of the rabbit, the nose is thick and swollen, the face arched, the upper lip divided, the ears round and naked, the eyes large, the upper jaw considerably longer than the lower, and the tail a naked flesh-colored stump. The hairs of the upper and fore parts of the body are annulated with brown, yellow, and black, which gives the animal a speckled yellow and green appearance on the neck, head, back, and sides.



THE BLACK AGOUTI.

The Black or Crested Agouti, *D. cristata*, is considerably smaller than the common agouti, being about the size of a rabbit, while that species approaches the dimensions of the hare. Its general proportions and form, however, are the same; but the hairs of the back and sides, instead of being annulated with various-colored rings as in that species, are nearly uniform black, while the long hairs of the croup are perfectly so; the belly and legs are equally covered with short dark hair. There is not any appearance of crest, and the tail is still shorter than in the common agouti. Both this species and the preceding seem to inhabit the same climates—Surinam, Guiana, and Brazil; the common agouti, however, appearing to have a rather more extensive range, and to be likewise found in the West India islands, and even as far south as Paraguay.

The Acouchy, or Olive Agouti, *D. acuschy*—the *Mus leporinus* of Linnæus—is considerably smaller than either of the foregoing species, and is at once distinguished by the greater length of its tail, which is upward of two inches in length, not much thicker than a crow's quill, and covered with short scattered hairs like those on the tail of a rat. In other respects it is of the same form as the other Agoutis: has the same naked round ears, the same large black eyes, and the same olive-green color, mixed with yellow and black. The hairs of the croup are not so long as in the agoutis, but are perfectly black; and all the under parts of the body, the breast, belly, and interior of the arms and thighs, straw-colored with a tinge of red. The hair of the legs and feet is short and black, and that of the body much finer in quality than the hair of the Agoutis. It inhabits some of the West India islands, Guiana, and the northern parts of Brazil.

The White-toothed Agouti, *D. croconata*, is a species founded by Wagler upon a specimen brought by Spix from the river Amazonas. It is about the same size as the common agouti, but it differs in its incisor teeth being entirely white, in having the tarsi shorter, the nails shorter, and the general hue of its fur much richer. The *D. prymnolopha* is a species described by Wagler, which inhabits Guiana. It is very beautiful, and is readily distinguished by the broad black band which runs along the hinder half of the back, and which is continued to the tail.

The Sooty Agouti, *D. fuliginosa*, is called *D. nigricans* by Natterer, and *D. nigra* by Dr.

Gray. It is readily distinguished by its black color and large size. It inhabits the northern provinces of Brazil.

Azara's Agouti, *D. Azaræ*, inhabits Paraguay, Bolivia, and the southern parts of Brazil. Waterhouse thinks it identical with Dr. Gray's *D. punctata*.



THE PORCUPINE.

THE PORCUPINES OR HYSTRICIENS.

This tribe is divided into the *Porcupines* proper and several other groups, which we shall notice under their respective generic heads.

Genus PORCUPINE: *Hystrix.*—This includes certain rodents whose covering consists for the most part of a kind of offensive and defensive armor, in the shape of spines or quills, instead of hairs, somewhat after the manner of the hedge-hogs. Their molars are four in number, with a flattened crown, variously modified by layers of enamel, which leave deep intervals; their tongue is rough, with spiny scales; the tail is short, and the feet plantigrade. Many of the species live in burrows, and have much the habits of rabbits. Their grunting voice, joined to their large and truncated muzzle, has caused them to be compared to the hog, whence their French name *Porc-Epic*, meaning *Spiny-pig*. From this we have derived the English name, having a similar signification.

The most celebrated species is the Common Porcupine of Europe, *H. cristata*, often called the *Italian Porcupine*, because, at present, it is most commonly found there, and the *African Porcupine*, because the ancients regarded it as having been first brought from Africa to Europe. It is called *Istrice* by the Italians, and *Porcopick* by the Germans. When full-grown it is about two feet in length, the longest spines exceeding a foot. The general color is grizzled dusky-black, resulting from an intermixture of various shades of white, brown, and black; upper part of the head and neck furnished with a crest of long lighter-colored hairs, capable of being raised or depressed at pleasure; hair on the muzzle and limbs very short, almost black on the limbs; that of the neck and under parts brownish, and of considerable length; on the fore-part and sides of the neck a whitish band; all the remaining parts of the back and sides, including the rump and upper parts of the hinder-legs, armed with spines, which are longest on the center of the back. The spines, almost of the thickness of a goose-quill in the middle, are supported at the base by a slender pedicle, and terminating in very sharp points, striated longitudinally, and ringed alternately with black and white; the rings an inch or more broad. Their usual position is lying nearly flat upon the body, with the points directed backward; when the animal is excited, they are raised by means of the subcutaneous muscles almost at right angles with the body, and then present a

very formidable appearance. They are not capable of being detached by the animal. The tail-quills are, as it were, cut off in the middle, and are consequently open at the ends, and produce a loud rustling noise when the animal agitates its tail.

The Porcupine is a nocturnal animal, sleeping in the burrow which it digs, and to which there are several openings, during the day, and coming forth at nightfall to seek its food, consisting principally of roots, fruits, and tender leaves. Its usual food near the Cape, where it is called *Yzer-Varken*, is the root of that beautiful plant, the *Calla Æthiopica*, which grows even in the ditches about the gardens; but it will frequently deign to put up with cabbages and other vegetables, and sometimes commits great depredations in the gardens themselves. It undergoes a partial hibernation, but its sleep is not of long duration, for it ventures abroad again at the very commencement of spring. The young are produced in August, and have very small spines.

The ancients were acquainted with the Porcupine, and Aristotle alludes to the story of its power in shooting its quills to a distance at its enemy, showing that this illusion had thus early taken possession of the popular mind. The tale is dwelt upon by Pliny with his usual love of the marvelous, and Ælian, Oppian, and Claudian have repeated the story with exaggerations. In suddenly raising his spiny armor, a loose quill may be detached by the Porcupine, but the power of ejaculation to a distance does not exist.

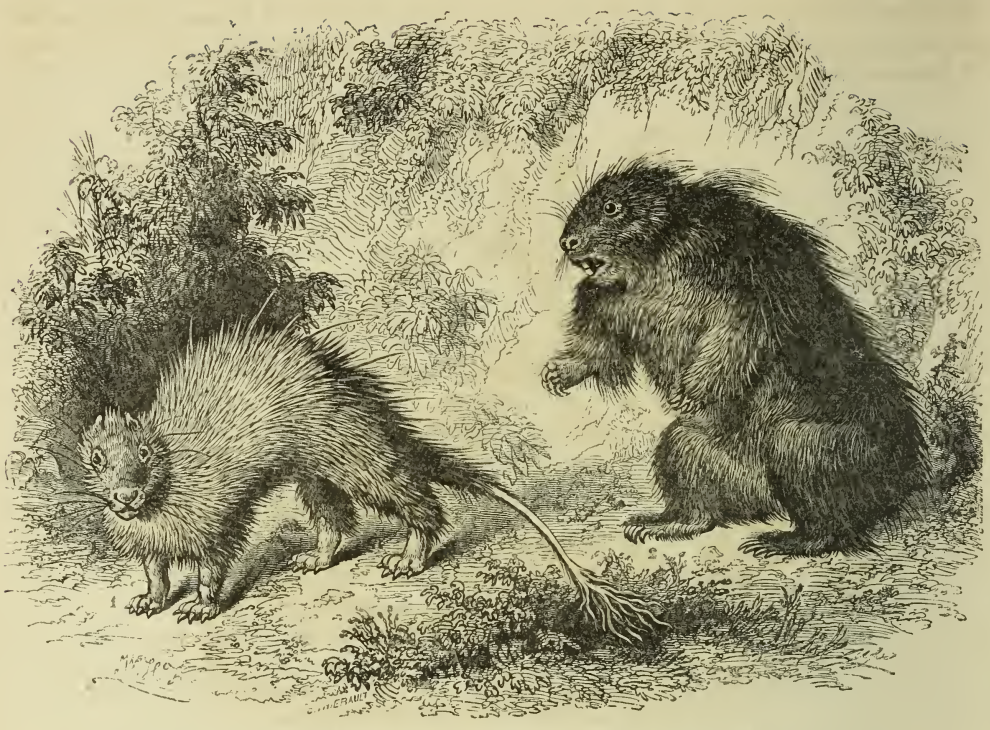
The use of the quills is simply that of a defensive armor, but as this seems a cumbrous device for such a purpose, we are led to insist on finding other advantages to be derived from them. Hence, Thunberg tells us that he was informed that the Ceylonese Porcupine had "a very curious method of fetching water for its young, namely, the quills in the tail are said to be hollow, and to have a hole at the extremity, and that the animal can bend them in such a manner as that they can be filled with water, which afterward is discharged in the nest among the young." Such inventions, to help nature out, so as to satisfy a narrow conception of her works, are doubtless the source of many of the common-place errors in respect to animals of peculiar organization; but the truth certainly is, that the Porcupine finds his quill armor an exceedingly convenient, useful, and effective defense, and he would be as imperfect without it as a wasp without its sting, or a cock without his spurs. The Porcupine is an exceedingly stupid creature, and hence, no doubt, nature supplied him with his formidable covering as a compensation for his lack of brains; as an indispensable provision in order to put him on a level with other brutes of his order. The mode by which nature equalizes her favors are infinitely diversified: some animals she endows with instincts, some with gifts analogous to reason, some with strength, some with dexterity, some with defensive or offensive weapons. The hare has speed, the squirrel activity, the marmot caution, the beaver ingenuity, the rat most or all of these qualities; the Porcupine, destitute of all, has his quiver of arrows, which he shakes in the face of his foe, to frighten him if he is a coward, and to pierce him if he has the courage to make an attack. In case of need, he will run backward at his enemy, and thus strike his sharp-pointed arrows into him. Without his quills, the Porcupine would seem to be a singularly unmeaning, uncouth, and helpless sot; with them, he has a position in history, and figures in literature as the emblem of human fretfulness and conceit.

The geographical distribution of the common Porcupine appears to be extensive. It is found wild in Italy, and is sometimes brought into the markets of Rome, where it is eaten, though its flesh is not highly esteemed; it is very rare in all the rest of Europe. It inhabits India, the sand hills along the southwestern shores of the Caspian Sea, Southern Tartary, Persia, Palestine, and the greater part of Africa.

The other species of this genus are the White-tailed Porcupine, *H. leucurus*, the *Sayal* of the Mahrattas, described by Colonel Sykes, and the *H. Hodgsoni*, or Crestless Nepaul Porcupine.

Genus ACANTHION: *Acanthion*.—Of this there are two species, very imperfectly known: the *A. Javanicum*, found in Java, and resembling the *H. cristata*, but somewhat larger, and the *A. Daubentonii*, probably a native of Africa, also resembling the *H. cristata*, but even larger than the *A. Javanicum*.

Genus ATHERURE: *Atherurus*.—Of this genus there are two known species, the most noted of which is the Fasciculated Porcupine, *A. fasciculatus*, the *Malacca Porcupine* of Buffon.



THE FASCICULATED PORCUPINE. THE CANADA PORCUPINE

The differences between this species and the common Porcupine are obvious at the first glance. Its general color is nearly the same, but with less intermixture of brown. The upper parts of the body, the outer sides of the limbs, and the head, neck, and face, are of this dusky hue; but the under parts, inside of the limbs, fore part of the neck, and throat, are of a grayish-white, with the exception of a darker band which crosses the breast in front of the fore-legs. The spines commence upon the back of the head, where they are little more than an inch in length, and extend to the root of the tail, occupying nearly the whole of the back and sides. The longest are scarcely more than from four to five inches in length, and extend to the root of the tail, occupying nearly the whole of the back and sides. They are mostly white at the base and black toward the extremity, but many of them are black throughout, and others black above and white beneath. All of them are marked on the upper surface by a deep and broad groove running the whole of their length, and terminate in very sharp points. The skin in which they are implanted appears perfectly white, and where the spines are most numerous is scarcely furnished with a single hair. A few slenderer spines, running into long black bristles, are occasionally intermixed with the others. The greater part of the tail is bare both of hairs and spines, and covered only by flat blackish scales, disposed in rings, the tip alone being surmounted by a tuft, or *fascicle*, or bundle of long flat bristles, having the form neither of hairs nor of quills, but bearing a close resemblance to narrow slips of parchment cut in an irregular manner. This tuft or fascicle is of a whitish color, and about two inches in length. The entire length of the body in a specimen lately at the Zoological Gardens of London was little more than a foot, and that of the tail from four to five inches. The whiskers were very long; the eyes small and black, and the ears short, round, and naked. Like the rest of its tribe, this species sleeps during the day, and becomes in some degree active only on the approach of night. Its intelligence is equally limited, and its manners equally fretful with those of the common species, like which, it raises its spines when irritated or disturbed, stamps with its feet upon the floor of its cage, and swells and looks big in its defensive armor. It is found in the Celebes Islands, and the Isles of the Indian Archipelago.

The Long-tailed Atherure, *A. macrurus*, the *Hystrix Orientalis* of Brisson, is found in Malacca; it is smaller than the preceding, but has been only obscurely described. The *A. Africanus*, is of Fernando Po, and the *A. armatus* of Gambia.



SWINDER'S AULACODE.

Genus AULACODE: *Aulacodus.*—Of this there is a single species, the Ground-Rat or Swinder's Aulacode, *A. Swinderianus:* this is of the size of a rabbit, of a brown color, with short legs and a long body, covered with short spines of nearly uniform length. The tail, of medium length, is covered with similar spines. A specimen has been furnished from Sierra Leone to the London Zoological Gardens. It is found on the western coast of Africa, and also in Southern Africa.

Genus ERETHIZON: *Erethizon.*—Of this there is a single species, the Canada Porcupine, *E. dorsatus;* the *Hystrix Hudsonii* of Brisson; the *Urson* of Buffon, and the only animal of the family of *Hystricidæ* found in North America. In this the ears are short and hid in the fur; head, body, legs, and upper part of the tail covered with rather coarse, long, dark-brown hair; on the upper part of the head, back, body, and tail, a dense mass of sharp, strong quills, the longest on the back, the least toward the head and sides; the longest four inches, but all nearly hid in the hair. Intermixed are some stiff, straggling hairs, three inches longer than the rest, tipped with dirty white; under side of the tail white; four toes on the fore-feet, five behind, each armed with long claws, hollowed on their under side. The form of the body is very clumsy, resembling that of a beaver, but in size it is smaller, averaging from twenty-four to thirty inches. The color, also, is subject to great variations, the long hairs on the sides, shoulders, and forehead being sometimes of a yellowish-brown, and sometimes of a dirty white. In most cases, however, it appears that the hips and under-surface of the tail, as well as the body, are a blackish-brown.

The great peculiarity of this animal consists in his spines, or quills, which are cylindrical in shape, sharp at the extremity, and pointed at the root. They are very easily detached, and are erected at pleasure. They are barbed with numerous reversed hooks or prickles, which, when once the shaft is imbedded in the flesh, constantly work deeper and deeper into it. The spines are from one to four inches in length, the longest on the back as above stated. They cover the whole upper surface, the under surface being clothed with hair, intermixed with fur of a softer texture. In old animals, the whole body above is a mass of spines, with tufts of hair six inches long on the shoulders, sides, and forehead. The eyes are small, the tail short, and covered above

with spines; the feet are plantigrade; the mammæ are pectoral, and four in number. The nest is made in hollow trees, or in caverns beneath the rocks. The young are produced in April or May, usually two at a time.

This animal is extremely sluggish in its movements, and often will not take the trouble to run away from dog or man, being, in this respect, very much like the skunk. As the latter relies on his liquid shaft, addressed to the nose, the former seems to put his trust in his thousand barbed arrows, which threaten the flesh. Of the two, the porcupine has the advantage, for when attacked by a dog, wolf, cougar, or other ferocious beast, it presses its nose downward, erects its quills, and brandishing its tail, stands ready for the onslaught. If the assailant is inexperienced, and unwarily seizes the hostile party with its mouth, he instantly retreats, with a howl of pain and dismay, for his nose, lips, jaws, and tongue are stuck full of the barbs of the porcupine. Unless some one extracts them, they work deeper and deeper, and often result in the death of the sufferer. Lynxes, wolves, and cougars have been found dead, or dying in the woods, from the effect of porcupine quills thus inserted in the fleshy parts of the mouth. The Indians of the North are said to have a deadly hatred of the porcupine, on account of the mischief it inflicts in this way on their dogs.

Richardson, in describing this animal, says: "It is readily attacked by the Indian dogs, and soon killed, but not without injury to its assailants, for its quills, which it erects when attacked, are rough with minute teeth directed backward, that have the effect of rendering this seemingly weak and flexible weapon a very dangerous one. Their points, which are pretty sharp, have no sooner insinuated themselves into the skin of an assailant, than they gradually bury themselves, and travel onward until they cause death by wounding some vital organ. These spines, which are detached from the porcupine by the slightest touch, and probably by the will of the animal, soon fill the mouths of the dogs which worry it, and unless the Indian women carefully pick them out, seldom fail to kill them. Wolves occasionally die from the same cause. The Canada porcupine makes its retreat among the roots of an old tree, and is said to pass much of its time in sleeping. When disturbed, it makes a whining or mewing noise. It pairs in the latter end of September, and brings forth two young ones in April or May. Its flesh, which tastes like flabby pork, is relished by the Indians, but is soon nauseated by Europeans. The bones are often deeply tinged with a greenish-yellow color. Like other animals which feed on coarse vegetable substances, it is much infested by intestinal worms. The quills or spines are dyed of various bright colors by the native women, and worked into shot-pouches, belts, shoes, and other ornamental articles of dress."

The Canada porcupine feeds on vegetables of various kinds, especially the bark and leaves of trees, preferring the birch, elm, bass, cotton-wood, hemlock, willow, larch, and various kinds of fir. It easily climbs trees, and when once it has begun to feed on a tree, it usually does not leave it, except at night to sleep in its bed, till it has stripped it from top to bottom. It is said that a single porcupine will thus denude a hundred trees in a season. Sometimes considerable patches of forest are found dead as if scorched by fire, having been gnawed bare by the porcupine. This animal is also fond of sweet apples and young Indian corn. In feeding, it sits on its haunches, and brings its food to its mouth with the fore-paws. It is capable of being domesticated, in which state it eats cabbages, turnips, potatoes, and even bread. It utters a growl when offended, and at night is heard to break out in low, querulous shrieks. It shows no attachment, and little intelligence, but is a mild, inoffensive creature, always supporting an air of surly indifference, with a tinge of stupid, awkward self-importance. Its greatest desire seems to be, to be let alone.

This animal is found in the Canadas, and north as far as latitude 67°. In some places it is still abundant, but is everywhere becoming more and more rare. It was once common in the northern parts of New York and Ohio, but is now scarce in those parts. It is not found south of these localities. In the Northwestern States it is frequently met with.

Genus SPHIGGURE: *Sphiggurus.*—Of this genus there are several species, all of which are climbers, with a prehensile tail partly naked. They are covered with short, sharp spines, concealed by the hair, on which account they are denominated *Hystrix insidiosa.* If handled without caution, they inflict severe wounds. The most noted species is the Couiy, *S. insidiosus,*



COUIY, OR SPHIGGURE.

described by Buffon under the name of *Coendou*, to which animal it has some analogy. It is about eighteen inches long, and the color is brown. Its movements are slow, and sometimes it continues twenty-four hours without a change of place. It is essentially a climber, and one described by Azara, in a state of domesticity, never walked on the floor, or on a flat surface, but crawled over the backs of the chairs, and placed itself on the window-shutters, where it remained for a long time. It ate sitting on its haunches, taking its food in its fore-paws. It was fed on bread, maize, manioc, herbs, and leaves, with flowers and fruits of various kinds.

The other known species are the *S. spinosus*, *S. villosus*, *S. melanurus*, and *S. bicolor*, all of various parts of South America. They resemble the *S. insidiosus*, and indeed all are regarded as the same species by some naturalists.

Genus CHETOMYS: *Chætomys.*—Of this there is a single species, the *C. sub-spinosus*, having cylindrical, sharp-pointed spines; the body thin and long, tail large, color a grayish-brown. The size is nearly that of the Couiy, the body measuring about eleven inches, and the tail ten. It is found in Brazil.

Genus SYNETHERE, or COENDOU: *Synetheres.*—Of this, the most noted species is the Coendou, or Brazilian Porcupine, *S. prehensilis.* It is the *Cuandu* of Marcgrave and Piso; the *Orico Cachero* and *Espinho* of the Portuguese; the *Hoitzlacuatzin* of Hernandez, and is thus described by Pennant: nose short and blunt; long white whiskers; beneath the nose a bed of small spines; top of the head, back, sides, and base of the tail, covered with spines; the longest on the lower part of the back and tail, three inches in length, very sharp, white, barred near their points with black; adhere closely to the skin, which is quite naked between them; are shorter and weaker as they approach the belly; on the breast, belly, and lower part of the legs are converted into dark-brown bristles; feet divided into four toes; claws very long; on the place of the thumb a great protuberance; tail eighteen inches long, slender, and taper toward the end; the



COENDOU, OR BRAZILIAN PORCUPINE.

last ten inches almost naked, having only a few hairs on it; has, for that length, a strong prehensile quality.

The Brazilian Porcupine appears very much to resemble the Canada Porcupine in its habits, living in woods, sleeping by day, and feeding on fruits, &c., by night. Marcgrave states that its voice is like that of a sow. The quills are stated to have the same penetrating and destructive quality as those of the Canadian species. It is a sluggish animal, climbing trees very slowly, and holding on with its prehensile tail, especially in its descent. It grows very fat, and the flesh is said to be white and well-tasted. Our cut is taken from a living specimen in the Gardens of the Zoological Society, Regent's Park. It is found in Brazil, Guiana, and Mexico.

It is supposed that there are several other species; the *C. Boliviensis* is mentioned by some naturalists. Brandt speaks of another species, which he includes under the generic name of *Cercolabes*, and the specific name of *Platycentrotus*.

THE CAPROMYENS.

This tribe, which belongs exclusively to America, comprehends several species, which in some cases have soft fur, and in others have their covering interspersed with small, weak spines. They have generally the appearance of large rats, and live on vegetable food.

Genus ECHIMYS: *Echimys*, or *Spiny-rats*.—This genus, which is analogous to the *Loncheres* of Illiger, embraces numerous species, of which the most noted is the CAYENNE ECHIMYS *E. Cayennensis*, the *E. setosus* of Geoffroy, and the *Loncheres anomala* of Kuhl. The head and body of this animal are about six inches long, and the tail of equal length; the ears are large; tarsi long, upper parts of the body chiefly covered with spines; sides likewise with spines, but with a considerable admixture of hairs; upper parts of the animal of a dusky-brown color; sides of the body, and more especially of the head, suffused with rufous; under parts white. It inhabits Guiana and Brazil.

The WHITE-SPINED ECHIMYS, *E. albispinus*, has the tail scaly and with short hairs; head, upper parts and sides of the body, with spines, those on the upper parts black at the extremity, and those on the flanks white; general hue on the upper parts brown, and of the flanks rufous; the whole under parts are pure white. It inhabits Bahia and Brazil.

The STRONG-SPINED ECHIMYS, *E. hispidus*, is about equal in size to the common black rat; the tail very nearly equal to the head and body in length, and well covered with longish hairs, excepting at the base; ears small; broad and strong spines cover the whole upper parts and sides of the animal, commencing on the back of the head; upper parts rusty-brown; feet, sides, and under parts of the body rust-colored. It inhabits Bahia and Brazil.



THE CAYENNE ECHIMYS.

The Short-tailed Echimys, *E. brachyurus:* the *E. spinosus* of Desmarest, and the *Loncheres rufa* of Lichtenstein, has the spines narrow and hidden by the fur; ears moderate; tarsus long; general color rich brown; under parts dirty white; feet dark brown. Its length is ten inches, the tail three inches. It burrows in the earth, and has spines mixed and matted with the hair, which is of two kinds, one soft and the other rough. The spines are easily detached. It inhabits Paraguay and Bolivia.

The Spineless Echimys, *E. inermis*, has the feet moderately long; tail rather shorter than the head and body taken together, and clothed with long hairs, which entirely hide the scales; fur soft, and without any mixture of soft hairs; general hue brown-yellow; under parts yellowish-white. It inhabits Bahia and Brazil.

The Cave Echimys, *E. antricola*, the *Nelomys antricola* of Lund, has the body stout, the muzzle thick, ears short, tail long, and well clothed with hairs; upper parts of the animal gray-brown, with an admixture of rusty yellow; under parts white; the hairs of the fur harsh and depressed. It inhabits the interior of Brazil.

Other species, held to be doubtful by some naturalists, are the *E. myosuros*, the *Loncheres myosuros* of Lichtenstein, the *Mus leptosomus* and *Mus cinnamomeus* of the same author, and the *Loncheres longicaudata* of Rengger.

Genus CERCOMYS: *Cercomys.*—Of this there is a single species, the Brazilian Cercomys, *C. cunicularius.* It is of a deep brown color above, paler on the flanks and cheeks, and whitish beneath; it is without spines. The length of the body is three to four inches, and the tail nearly the same. The dentition is peculiar. It is found in Brazil.

Genus NELOMYS: *Nelomys;* the *Loncheres* of Jourdan.—The animals of this species have their covering more or less spiny, and the tail often furred. They resemble the *Echimys*, and are treated only as a subgenus by Gervais. There are several species.

The Crested Nelomys, *N. cristatus*, is the Golden-tailed Rat of Buffon. In its size and the form of its tail it bears no inconsiderable resemblance to the common rat, the body being eight inches long and the tail a trifle longer. Its color is maroon, with a purple ground, very deep on



BRAZILIAN CERCOMYS.

the back, the sides, and sides of the head, but lighter on the under part. This color extends along the tail for a short distance from its base; but the principal part of that organ is of a rich orange, and there is a spot of the same color on the face. There is a portion of the tail between the maroon and the orange of a black color, and the hair upon the whole of the tail is short and fine.



THE CRESTED NELOMYS.

The head is large in proportion to the size of the animal; the muzzle and facial line are straight; the eyes are very small; and though the ears have large openings, they do not rise much, if at all, above the level of the head. At the corners of the upper jaw there are tufts of brown hair forming a sort of whiskers, which are longer than the breadth of the head. The hair on the back of the animal is coarse and strong, and more than an inch in length, and bears some resem-

blance to shining pins. It continues on the sides and flanks, but is wanting on the lower part of the body, which is covered with softer and smoother hair. On this part of the body it is very short, not exceeding one twenty-fourth part of an inch in length.

The female has eight mammæ, which indicates a progeny rather numerous, though little is known of the manners of the species. It is understood, however, that they are subject to considerable variety of color, either in different individuals or at different ages; for some have been brought to Europe in which the produced and flattened hairs on the upper part were brown, and not maroon; but as these were smaller in size than the more richly colored ones, it is probable that they were in an immature state. This species lives in the woods under trees, and is supposed to subsist chiefly upon fruits.

Besides this species, there are the Straw-colored Nelomys, *N. paleaceus*, found in Brazil; Blainville's Nelomys, *N. Blainvillii*, found in the province of Bahia; the *N. didelphoïdes*, *N. armatus*, and *N. semi-villosus*.



DACTYLOMYS.

Genus DACTYLOMYS: *Dactylomys.*—Of this there is a single species, the *D. typus* of Is. Geoffroy, and the *Echimys dactylinus* of E. Geoffroy. It is more than nine inches from the muzzle to the insertion of the tail, and the tail itself is twelve inches. The hair upon the body is hard and dry, but not spinous; that on the front is flattened, but on the hinder part it is longer and rougher, and on the upper part of the neck it stands up like a sort of crest. The middle toes of the feet are much larger than the outer ones; the nails on the toes of the fore-feet are flat, something in the form of those of the sapajous; but on the hind-feet, which have five toes, they are very strong and crooked; the tail, throughout the whole of its length, is naked of hair, and scaly. The manners of this species are very little known.

Genus LASIUROMYS: *Lasiuromys.*—Of this there is but one species, the Hairy Lasiuromys, *L. villosus*, which is found along the Amazon, and is of a reddish-gray color, and is supposed to be a tree-climber; it is about eight inches long, and its tail seven.

Genus CAPROMYS: *Capromys.*—The animals of this genus are of a heavier mould than the preceding; their covering is not spiny, but the hair is rough; the tail is rather long and scaly, and

the mustaches strong. They have a movement similar to that of the rats, live in the woods and plantations, and have often been compared to rabbits. They are herbivorous, and easily climb trees. There are three species, all of the Island of Cuba.

Fournier's Capromys, or the Short-tailed Capromys, *C. Fournieri*, the *Isodon pilorides* of Say, is blackish-brown above, and grayish-white beneath; the body is fourteen inches long, and the tail, which is scaly like that of the rats, is six. It is called *Hutia Congo* in Cuba, and is capable of being tamed.

The Prehensile-tailed Capromys, the *Capromys prehensilis*, is known in Cuba by the name of *Hutia Carabali*, and is said to confine itself to parts of the forests which are remote from the habitations of man, and to be more shy and less tamable than the preceding. Like this, it is an expert climber, and confines itself to the uppermost branches of trees. The tail, which is of moderate length, is prehensile at the extremity; the animal, assisted by this organ, is enabled to cling with security to the small twigs of the trees, or to the parasitic plants with which they are overgrown, and among which it usually conceals itself.

Poey's Capromys, *C. Poeyii*, is of a chestnut-color, spotted with red and yellow.

Genus PLAGIODONTIA: *Plagiodontia.*—Of this a single genus is known, the *P. œdium.* It inhabits the Island of St. Domingo, and is nearly allied to the capromys of the neighboring Island of Cuba. Its short and naked tail, combined with certain differences observable in the structure of the molar teeth, furnish the chief distinguishing characters. It is generally of a light-brown color above, and whitish-yellow below. It often visits the houses by day, but departs at night. It lives on fruits and vegetables, and like other animals which have a vegetable diet, is good food.



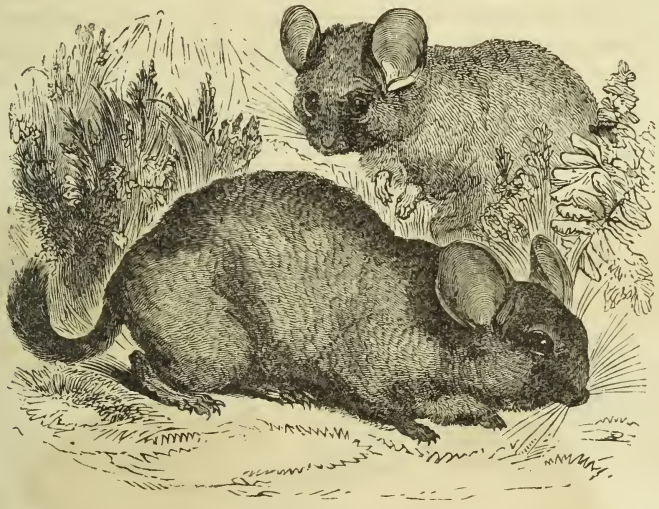
THE COYPU.

Genus MYOPOTAMUS: *Myopotamus.*—Of this there is a single species, the well-known Coypu, *M. Coypus;* the *Coypu Rat* of Shaw. This has ears of moderate size; fur long; upper parts of the animal penciled with dusky and brownish-yellow in about equal proportions; sides and under parts of the prevailing tint, brown-yellow; tip of muzzle and chin white; a yellow patch immediately beneath the ear opening; feet dusky-brown. In size it is nearly equal to the beaver, and bears a considerable superficial resemblance to that animal; its tail, however, is cylindrical, has a scaly skin, and is scantily clothed with hairs, short and stiff, like that of the rat. The hair is fine and silky, and has at the base a wool similar to that of the beaver; it is

used, in fact, for the same purpose as the fur of the beaver. An immense trade is carried on from South America in the skins of the Coypu, which are called *La Plata Beaver*; they are also called *Ragondin* and *Nutria*. Gervais calculates that three millions of these skins are annually supplied. These animals are nocturnal, and are hunted at night by dogs.

The body of the Coypu is twenty-four inches long and its tail fifteen; the female produces six or seven at a birth. Its food is vegetable, and its character gentle. It is capable of being tamed, and in this state shows much docility. It inhabits the banks of the rivers and streams of a great portion of South America, occurring on both sides of the Andes. On the eastern side it extends from Peru southward to 43° south latitude. On the west it ranges from the valleys of Central Chili to Tierra del Fuego. In the Chonos Archipelago, it lives exclusively along the bays and channels which extend between the innumerable small islets of that group. It makes its burrows within the forest, at a short distance from the rocky beaches.

The inhabitants of Chiloe, who sometimes visit this archipelago for the purpose of fishing, state that the Coypus here do not live solely on vegetable matter, as is the case with those inhabiting rivers, but that they sometimes eat shell-fish. The Coypu is said to be a bold animal, and to fight fiercely with the dogs employed in chasing it. Its flesh is white and well-flavored. Buenos Ayres appears to be the center of the trade in the furs of this animal.



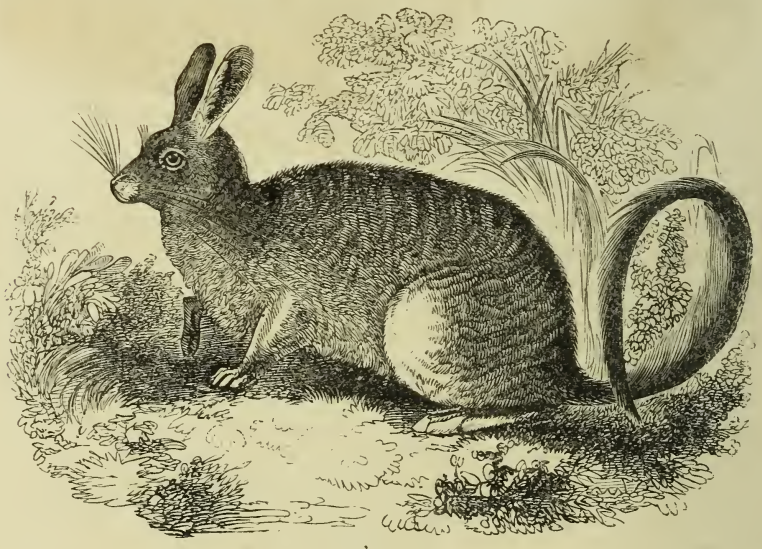
CHINCHILLAS.

THE CHINCHILLIENS.

This tribe comprises three genera, all belonging to South America, and all distinguished for the softness of their fur.

Genus LAGOSTOMUS: *Lagostomus.*—Of this there is a single species, the Viscacha or Biscacha, *L. viscaccia*, and which serves as the type of the genus *Callomys* of Is. Geoffroy. It somewhat resembles the rabbit, but has smaller ears, and a tail one-fourth the length of the body. Its fur is full, thick, and fine, but less delicate than that of the chinchilla. It is a brownish-gray above, passing into white beneath; the hair of the tail is dry and rough to the touch. These animals are found in abundance on the pampas of Buenos Ayres, where they are hunted and killed in large numbers, because they dig up the soil, injure the crops, and furnish a valuable fur, used for making caps. Their flesh is not eaten. They live in societies, move in leaps somewhat like the kangaroo and jerboa, seldom quit their native locality, feed on grains and fruits, and especially a kind of grass resembling lucerne; sit on their haunches, carry food to the mouth with the fore-paws, have various cries, and bring forth four or five young at a birth. A specimen taken to London ate bread, carrots, and various other vegetables.

Darwin furnishes us with the following account: "Near Buenos Ayres these animals are exceedingly common. Their most favorite resort appears to be those parts of the plain which, during one half of the year, are covered with great thistles to the exclusion of other plants. The Guachos affirm that it lives on roots, which, from the great strength of its gnawing teeth and the kind of localities frequented by it, seems probable. As in the case of the rabbit, a few holes are commonly placed together. In the evening the Viscachas come out in numbers, and there quietly sit on their haunches. They are at such times very tame, and a man on horseback passing by seems only to present an object for their grave contemplation. They do not wander far from their burrows. They run very awkwardly, and when hurrying out of danger, from their elevated tails and short front-legs, much resemble great rats. Their flesh, when cooked, is very white and good, but it is seldom used. The Viscacha has one very singular habit, namely, dragging every hard object to the mouth of its burrow. Around each group of holes many bones of cattle, stones, thistle-stalks, hard clumps of earth, dry dung, &c., are collected into a heap, which frequently amounts to as much as a wheelbarrow would contain. I was credibly informed that a gentleman, when riding in a dark night, dropped his watch; he returned in the morning, and by searching in the neighborhood of every Viscacha hole on the line of road, as he expected soon found it. This habit of picking up whatever may be lying on the ground anywhere near its habitation must cost much trouble. For what purpose it is done I am quite unable to form even the most remote conjecture; it cannot be for defense, because the rubbish is chiefly placed above the mouth of the burrow, which enters the ground at a very small inclination."



CUVIER'S LAGOTIS.

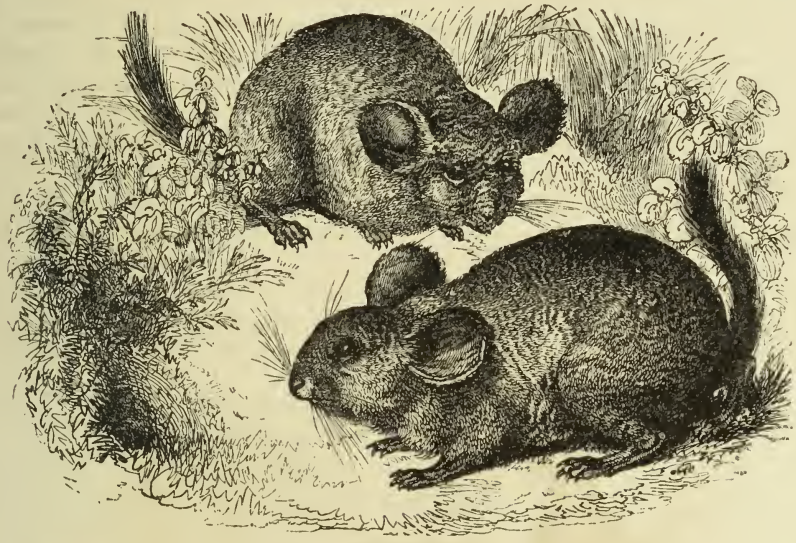
Genus LAGOTIS: *Lagotis.*—Of this there are two known species. CUVIER'S LAGOTIS, *L. Cuvieri*, resembles the preceding, but the body is more slender, the ears longer, and the tail much larger. Its general appearance reminds one of the hare. The body above is yellow, with a faint tinge of green, in parts slightly mottled with black; below it is a golden yellow, with a faint reddish wash; the mustaches are black. The fur is exceedingly fine and soft to the touch, and the Indians make blankets and mantles of it. The tail is carried stretched out, and its joints are slender and scaly. The flesh is eaten by the Indians. It lives in rocky and stony places, feeds on herbs and shrubs, and digs burrows with two flats or stories, one above the other. It appears that this is also sometimes called *Viscacha*. It is very abundant on the western slopes of the Andes, from latitude 18° to 30° south.

The *Lagotis pallipes* is found in the rocky valleys of Chili. To these two species, Mr. Gay adds a third, *L. criniger;* but whether it is in fact a distinct species, is not determined.

Genus CHINCHILLA: *Chinchilla.*—Lichtenstein gives this the generic name of *Euryotis.*

There is a single species, the *C. lanigera*, which produces the well-known chinchilla fur. This is described by Molina, as follows:

"The chinchilla is another species of field-rat, in great estimation for the extreme fineness of its wool, if a rich fur as delicate as the silken webs of the garden-spiders may be so termed. It is of an ash-gray, and sufficiently long for spinning. The little animal which produces it is six inches long from the nose to the root of the tail, with small pointed ears, a short muzzle, teeth like the house-rat, and a tail of moderate length, clothed with a delicate fur. It lives in burrows



CHINCHILLAS.

underground, in the open country of the northern provinces of Chili, and is very fond of being in company with others of its species. It feeds upon the roots of various bulbous plants which grow abundantly in those parts; and produces twice a year five or six young ones. It is so docile and mild in temper that, if taken into the hands, it neither bites nor tries to escape, but seems to take a pleasure in being caressed. If placed in the bosom, it remains there as still and quiet as if it were in its own nest. This extraordinary placidity may possibly be rather due to its pusillanimity, which renders it extremely timid. As it is in itself peculiarly cleanly, there can be no fear of its soiling the clothes of those who handle it, or of its communicating any bad smell to them, for it is entirely free from that ill odor which characterizes the other species of rats. For this reason it might well be kept in the house with no annoyance, and at a trifling expense, which would be abundantly repaid by the profits on its wool. The ancient Peruvians, who were far more industrious than the modern, made of this wool coverlets for beds and valuable stuffs. There is found in the same northern provinces another little animal with fine wool, called the *Hardilla*, which is variously described by those who have seen it; but as I have never observed it myself, I cannot determine to what genus it belongs."

Bennett expresses the opinion that the *Hardilla* is the same as the chinchilla. In describing a specimen of the latter in the London Zoological Gardens, he says, "that it usually sits upon its haunches, and is even able to raise itself up and stand upon its hinder feet. It feeds in a sitting posture, grasping its food and conveying it to its mouth by means of its fore-paws. In its temper it is generally mild and tractable, but it will not always suffer itself to be handled without resistance, and sometimes bites the hand which attempts to fondle it when not in a humor to be played with. Although a native of the alpine valleys of Chili, and consequently subjected in its own country to the effects of a low temperature of the atmosphere, against which its thick coat affords an admirable protection, it was thought necessary to keep it during the winter in a moderately warm room, and a piece of flannel was even introduced into its sleeping apartment for its greater comfort. But this indulgence was most pertinaciously rejected, and as often as the flan-

nel was replaced, so often was it dragged by the little animal into the outer compartment of its cage, where it amused itself with pulling it about, rolling it up, and shaking it with its feet and teeth. In other respects it exhibits but little playfulness, and gives few signs of activity; seldom disturbing its usual quietude by any sudden or extraordinary gambols, but occasionally displaying strong symptoms of alarm when startled by any unusual occurrence." A second specimen being presented to the Society, it was put into the same cage as the preceding, when a scuffling fight occurred between the two, which led to their being kept apart. They were fed on dry hay and clover, grain and succulent roots. Several litters have been produced in the London menagerie.

The fur of this species is a considerable article of commerce. For muffs, tippets, linings to cloaks and pelisses, and trimmings for the same, it is sold extensively, and at a comparatively high price. The annual import of the skins into England, in 1851, was 85,000. The skins which come from Upper Peru are rougher and larger than those from Chili, but not always so beautiful in color. Great numbers of these animals are caught in the neighborhood of Coquimbo and Copiapo, generally by boys with dogs, and sold to traders, who bring them to Santiago and Valparaiso, from whence they are exported. The Peruvian skins are either brought to Buenos Ayres from the eastern parts of the Andes, or sent to Lima. The extensive use of this fur has occasioned a very considerable destruction of these animals.

Some naturalists have mentioned an animal of Peru rather larger than the preceding, but very much resembling it, to which they give the name of *C. brevicaudata*, and believe it to be a distinct species of chinchilla; but this is not yet decided.



PELE'S ANOMALURE.

THE ANOMALURES.

Of this tribe there is the single genus, ANOMALURE, *Anomalurus*, and two species. Fraser's Anomalure, *A. Fraseri*, the *Pteromys Derbianus* of Gray, is a most extraordinary creature, found in the island of Fernando Po. It resembles the flying-squirrel or *Pteromys*, in having a

flying-membrane on each side, and using them in the manner of that animal, in gliding from tree to tree. It has, however, beneath the base of the tail, which is long and plume-like, a series of horny imbricated scales, ten in number, which appear to serve as a defense to the animal as it alights upon the trunks of the trees in its leaps or flights. It is lively and graceful in its motions, climbs the trunks and branches of trees with dexterity, and launches itself with great precision of aim from one tree to another. In the length of its flights it even surpasses the *Pteromys*. Its fur is long, especially on the back; the color is red, spotted with brown; below it is light yellow. This animal, whose body is eighteen inches long, and the tail about the same, resembles alike the squirrels and the dormouse, but its dentition places it with the *Hystricidæ*.

Pele's Anomalure, *A. Pelei*, resembles the preceding, and is found on the western coast of Africa.



THE BRAZILIAN CTENOMYS.

THE CTENOMYDES.

Of this family there are several genera, all South American; some of them climb the trees, living, like the dormouse and the squirrel, upon nuts and fruits. Some run upon the ground, and others burrow beneath the soil. They have affinities with both the Chinchilliens and Pseudostomides.

Genus CTENOMYS: *Ctenomys*.—The animals of this genus have a rather long body, ears small and nearly hidden in the fur, tail about one-fourth the length of the body. They resemble the campagnols, or field-mice, but are of much larger size.

The Brazilian Ctenomys, *C. Brasiliensis*, is reddish above and white beneath; body six inches long, the tail two inches. It lives near water, and mines the earth with its numerous galleries. It is found in Bolivia, Brazil, and the Argentine Republic. It is common in the sandy valleys of the western slope of the Andes, 12,000 feet above the level of the sea.

The *C. Boliviensis* and *C. Nattereri*, noticed by some writers, are the same as the preceding.

The Magellan Ctenomys, *C. Magellanica*, resembles the preceding, and is found in the dry sandy plains of Patagonia, where it burrows in the soil so as to make it dangerous for travelers on horseback.

Genus PEPHAGOMYS: *Pœphagomys*.—Of this there is a single species, the Black Pephagomys, *P. Ater:* this is five inches long, of a black color, and has nearly naked ears; it feeds

on vegetable substances, and perforates the earth with its burrows, like the preceding. It is partly nocturnal in its habits, and is found in Chili, where it is called *Cururo*. It is probably the Blue Rat, *Mus cœruleus* of Molina, and certainly the *Spalacopus Pœppigii* of Wagner.



THE BLACK PEPHAGOMYS.

Genus SCHIZODON: *Schizodon*.—Of this there is one species, the Brown Schizodon, *S. fuscus*, which has rather a slender body, eight or nine inches long, tail less than half the length of the body, color grayish-brown above, and grayish-fawn below. It is found in Chili.



CUMING'S OCTODON.

Genus OCTODON or OCTODONTE: *Octodon*, referred to the *Hystricidæ* by Waterhouse, embraces several species, which derive their generic name of *Octodonte*, meaning *eight-toothed*, from the number of the molar teeth, the crowns of those below having at the same time nearly the form of the figure 8.

Cuming's Octodon, *O. Cumingii* or *O. degus*, the *Sciurus degus* of Molina, in size and shape resembles the water-rat. The fur is long and moderately soft; upper parts of the body penciled with black and pale brownish-yellow; dirty white beneath. The length of the body is four and a half inches; that of the tail two inches. It is a native of Chili, and may be seen by hundreds in the hedgerows and thickets in the central parts of that country, where they make burrows close together, leading one into the other. They feed by day in a fearless manner, and are very destructive to fields of young corn; when disturbed, they all run together toward their burrows, in the same way that rabbits do when feeding outside a covert. When running they carry their tails elevated; they may be often seen seated on their haunches, like squirrels. They lay up a store of food for the winter, but do not become dormant. Occasionally they climb among the branches of the bushes. They have a very extended range, from 28° N. latitude to the 35th parallel south. In the province of Coquimbo, where the country is sterile, they take up their abode among the loose stones on the sides of the mountains, and are frequently met with in the holes of the chinchillas. Their food consists of the herbage which grows at the roots of the hedges; in the winter months, when pressed by hunger, they feed upon the tender bark of the *Mimosa Cavenia*, and also on that of the *Cestrum Palqui*. They breed but twice in the year, and have from four to six young at a birth.

Bridges's Octodon, *O. Bridgesii*, has the fur very long and moderately soft; upper parts strongly penciled with brown, yellow, and black; abdomen white suffused with pale brown, yellow, or cream-colored. It inhabits Chili.

The Dormouse Octodon, *O. glirŏides*.—In this species the fur is soft, ashy-gray on the upper parts of the body, and white beneath; is a very pretty animal, the body being five inches long, and the tail three and a half. It is found in the Bolivian Andes, 10,000 feet above the level of the sea, where it may be seen among the cactus hedgerows.

Genus ABROCOME: *Abrocoma*.—The animals of this genus, of which there are two species, seem to form a transition from the Ctenomydes to the Chinchilliens. Cuvier's Abrocome, *A. Cuvieri*, is grayish-yellow above, and gray beneath. It is seven or eight inches long, and is found in Chili. Bennett's Abrocome, *A. Bennettii*, resembles the preceding, and is also found in Chili.



CANADA POUCHED-RAT.

THE PSEUDOSTOMIDES, OR POUCHED RATS.

This family comprises several small rodents, all of which are American, and some of which are burrowers, and others climbers. They possess large cheek-pouches, and are divided into two

tribes, the *Saccophoriens* and *Saccomyens*. We shall notice them under six genera, the two first of which belong to the *Saccophoriens*, and the four last to the *Saccomyens*.

Genus SACCOPHORUS: *Saccophorus*.—This term—which is nearly synonymous with the *Pseudostoma* of Say, the *Geomys* and *Diplostoma* of Rafinesque, the *Ascomys* of Lichtenstein, and the *Saccomys* of F. Cuvier—means *Sack-Bearer*, and includes various small animals found from Canada to Mexico. They are partially nocturnal, hibernate, and become somewhat dormant in winter, in cold but not in warm countries, and use their cheek-sacks or pouches, which generally open externally, for the purpose of bringing food to their burrows. They are all vegetable eaters.

The Canada Pouched-Rat, or the Pursed-Saccophorus, *S. bursarius*, is of a reddish-brown color above, and dark-brown below; the body, which is stout and cylindrical, is seven or eight inches long, the tail two and a quarter. The cheek-pouches, one on each side, open externally, so that food in the pouches has to be taken out and carried round to the mouth; they are very large, being three inches deep, and lined with hair. The eyes are small, the ears short and hardly visible. The fur is thick and soft. It digs extensive burrows in sandy places, much in the manner of the mole, though lower down. At distances of some twenty yards apart, it has openings, usually near some spot covered with grass or vegetables. It sometimes frequents gardens, where it eats the roots of the plants and gnaws the bark of the peach-trees. Sometimes it destroys large numbers of fruit-trees, plums, pears, and apples. The pouches are used to convey food to its burrows; it can travel nearly as fast backward as forward; it bites severely, and resists an attack uttering sharp screams. These creatures fight among themselves with their snouts like hogs. They feed sitting on their rumps, using their fore-paws like hands; they clean their hair, whiskers, and body like rats and squirrels. They feed on vegetables of various kinds; the nest is usually rounded, formed of soft substances, lined with the hair of the female, and is placed in the center of several converging galleries. The young are five to seven at a birth, and are produced in March or April. This species is found in Canada, and thence westward to the Pacific, and southward, in certain localities, to Arkansas. It is common in Illinois and Missouri; at the latter place it is called *Mulo*.

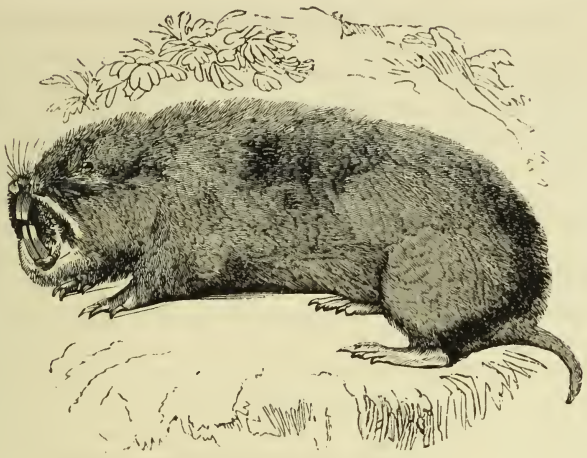
There are many other species of pouched rats in North America, but the only ones mentioned by Gervais under this genus are the *S. Mexicanus* and *S. Bottæ*, the first found in Mexico and the last in California. M. Leconte, in a recent work, enumerates eleven species for the United States and Mexico, arranging them under the genus *Geomys*. Other writers notice the following under the generic name of PSEUDOSTOMA, including those mentioned by Gervais and Leconte. The cheek-pouches, generally, open outside of the mouth.

The Columbia Pouched-Rat, *P. Douglassii*—the Columbia Sand-Rat of Richardson—is six inches and a half long, is of a dusky-brown color, and of a lighter shade beneath. It is found west of the Rocky Mountains, from the sources of the Missouri to Fort Vancouver. It burrows in the sand-hills, and feeds on nuts, acorns and grasses; in the vicinity of the settlements it commits great havoc in the potato-fields, alike by eating and carrying off in its pouches large quantities of the potatoes.

The Mole-shaped Pouched-Rat, *P. talpoïdes*, is grayish-black, seven inches long, and is found from Hudson's Bay to the Saskatchewan.

The Camas Rat, *P. Borealis*—the *Geomys Townsendii* of Richardson—is called *Gauffre* by the French, and hence Gopher by the Americans, a term also applied to several other species; it is of a pale yellowish-gray, seven and a half inches long, and derives its common name from its fondness for the *Quamash* or *Camas plant*, *Scilla esculata*. It is exceedingly voracious, and, like all other pouched-rats, feeds on nuts, roots, grasses, and seeds, and makes burrows, not far beneath the surface of the ground, to a great distance. It is said that in digging its burrows it uses its large cheek-pouches like bags to bring up the earth, emptying them at the mouth of the burrow. Like others of this tribe it is to a certain extent gregarious, many of them being always found in the same locality. This species is common near the Columbia River in Oregon.

The Southern Pouched-Rat, *P. Floridana*, is of a brownish-yellow above and gray beneath; its length is between eight and nine inches. It resembles the Canada pouched-rat, and is probably the species named the *Georgia Hamster* by Rafinesque and others. Its cheek-pouches, however, open into the mouth. It is found in Florida, Georgia, and Alabama.



THE CAMAS RAT, OR GOPHER.

The Reddish Pouched-Rat, *P. fulvus*, is of a light reddish-brown above and whitish beneath. Its length is five inches, and is found in the western parts of New Mexico.

The Chestnut-cheeked Pouched-Rat, *P. castanops*, is of a pale yellowish-brown, is eight inches long, and is found on the southwestern prairies.

The *P. hispidum* is of a reddish-brown color, eleven inches and a half long, and is found in Mexico.

Leadbeater's Sand-Rat, *P. umbrinus*, is of an amber-brown above, and gray beneath; it is seven inches long, and is found in Louisiana.

The Mexican Pouched-Rat, *P. Mexicanus*, noticed by Gervais, as already mentioned, is eleven inches long, with shiny hair of a cinereous blackish color.



THE SEWELLEL.

To this list we may add the Tuft-tailed Pouched-Rat, the *Perognathus penicillatus* of Woodhouse, which is three and a half inches long, with a tail a trifle longer. It is found in New Mexico. The *Saccophorus Bottæ*, mentioned by Gervais, is probably the same as the *Geomys rufescens* of Leconte.

Genus APLODONTIA : *Aplodontia.*—Of this there is a single species, the SEWELLEL of Lewis and Clark—the *Arctomys rufa* of Griffith's Cuvier—*A. leporina*, digging burrows and living in small societies in the neighborhood of the Columbia River, and abundant near the Great Falls. It is about the size of the gray rabbit, being fourteen inches long, with a tail half an inch long. It is of a reddish-brown color, and has no cheek-pouches; the eye is small, and the fur thick and soft, resembling that of the musquash. The skins are much used by the Indians for robes. It feeds on vegetables, and is said occasionally to climb trees, but only for a short distance, as is the case with the woodchuck. It produces four to five young at a birth.

The preceding genera belong to the *Saccophoriens ;* the following to the *Saccomyens.*

Genus SACCOMYS : *Saccomys.*—Of this there is a single species, the *S. anthophilus*, found in South America. It is of the size of a common rat, and of a brownish-fawn color; feeds chiefly on flowers, and has large sacks opening externally at the sides of the mouth.

Genus HETEROMYS: *Heteromys*, including two species.—THOMSON'S HETEROMYS, the *Mus anomalus* of some authors, which is of a brownish chestnut-color, has weak spines mingled with its hair, and a very long, scaly, black tail. It is of the size of the common rat, and is found in the Island of Trinidad, West Indies. DESMAREST'S HETEROMYS is four inches long, with a tail a trifle shorter. It is of a nut-brown color, has rough hair, and moderate-sized cheek-pouches. It is found in Colombia.



PEDETIENS OF SOUTHERN AFRICA.—(See p. 421.)

Genus DIPODOMYS : *Dipodomys.*—This term is from the Greek *dipous*, two-footed, and *mus*, a mouse, and alludes to the fact that the animals to which it is applied move on two feet. They are in fact a kind of *Pouched Jerboa-mouse*, having long hind-legs, on which they move like the

jerboa, with a tail long and tufted at the end, and living on vegetable food. Their cheek-pouches open externally.

Phillips's Pouched Gerboa-Mouse, *D. Phillipsii*, is about as large as the chip-squirrel, having a body five inches long and a tail six and a half inches; the color is light-brown above and white beneath. The whiskers are rigid and numerous, hind-legs very long, the fur silky, the eyes bright, the form and appearance like a very minute kangaroo. It hops about on its hind-legs, often taking considerable leaps. It lives in holes in the arid plains of Sonora and Southern California, seeming to prefer stony slopes, and frequently comes around the tents of travelers with a sort of confiding gentleness and familiarity. It seems to go forth chiefly at nightfall.

Several other species of this genus have been recently discovered. Ord's Pouched-Mouse, *D. Ordii*, is dark-brown above and white beneath; the tail is short and tufted at the end; it is a little smaller than the preceding, and is found in the vicinity of El Passo.

The Agile Dipodomys, *D. agilis*, is ten and a half inches long, the tail six and a half; the color a yellowish-brown above; on the sides and beneath it is white; eyes large; large external cheek-pouches; hind-legs very long. It is a beautiful species, leaps with surprising agility, sometimes ten feet at a bound. It forms extensive burrows, and is difficult to be captured. It abounds in the cultivated fields and vineyards near Puebla de los Angelos, California.

Hermann's Dipodomys, *D. Hermannii*, is found in the Sierra Nevada, but is little known.

Genus MACROCAULUS: *Macrocaulus*, presents a single species, *M. halticus;* this has the body four inches, and the tail six inches long. It is found in Mexico, but has not been fully described.



JERBOAS.

THE DIPODIDÆ.

This curious family embraces three tribes of small animals: the *Jerboas*, *Pedetiens*, and *Ctenodactyliens*.

THE JERBOAS OR JERBOIDÆ.

This tribe has been divided into several genera by some naturalists, as *Scirtopodes*, *Scirtomys*,



JERBOAS.

Alactaga, and *Acontion*, but we shall group them under the single genus, JERBOA, *Dipus*. These animals have the head large and rabbit-like; the ears long and pointed; the eyes full; the tail very long, covered with short hair and tufted at the end, this member being used in leaping and walking; the fur is soft and delicate; the fore-feet are very small; the hind-legs are long, and the hind-feet large and strong, and covered with hair. They seem expressly designed to live on desert wastes, where they are usually found. Four species are known.

The Gerbo, or Egyptian Jerboa, *D. sagitta*, seems to have excited the curiosity of mankind from the earliest times. Aristotle speaks of it as an Egyptian rat that walks on two feet, and Pliny calls it a *walking-biped*. In size it is equal to a small rat, the body being five inches long and the tail seven; the general color is a pale tawny-yellow, passing into a lighter tint, and finally into white below. It is found in Egypt, Nubia, parts of Syria, and Barbary, living in troops on the arid deserts, digging long burrows in heaps of sand, and often amid crumbling ruins. In these burrows they make their nests and rear their young. Their food consists of grain, bulbous roots which they dig up with their fore-paws, and of other vegetables. They hibernate, but are dormant for only a short time. Their flesh is unsavory, but is still eaten. When undisturbed, their common manner of sitting is on their haunches, their short fore-paws hanging down like those of the Kangaroo. So powerful are their teeth that they speedily gnaw through the hardest wood. They are partially nocturnal in their habits, are exceedingly timid, and hasten to their burrows upon the slightest alarm. So great is their speed in flying across a plain that they will outstrip a greyhound. In making each leap they spring from the hind-feet, the impetus being given by the powerful muscles of the thighs, while the tail serves as balance and rudder. So essential is the tail, that when deprived of it the animal seems to be afraid to leap, and indeed to have lost its power. In springing, the fore-paws are pressed close to the breast; they descend, however, upon them at each bound, but such is the celerity of the movement that the eye is deceived, and the fore-paws seem not to be used at all in the act of running.

The Dark-banded Jerboa, *D. Indicus*, is thus described by General Hardwicke: "These animals are very numerous about cultivated lands, and are particularly destructive to wheat and barley crops, of which they lay up considerable hoards in spacious burrows near the scenes of their plunder. They cut the culms of the ripening corn just beneath the ears, and convey them thus entire to one common subterraneous repository, which, when filled, they carefully close, and do not open for use till supplies abroad become distant and scarce. Grain of all kinds is their favorite food; but in default of this they have recourse to the roots of grass and other vegetables. About the close of day they issue from their burrows, and traverse the plains in all directions to

a considerable distance; they run fast, but oftener leap, making bounds of four or five yards at a time, carrying the tail extended in a horizontal direction. When eating, they sit on their hind-legs like a squirrel, holding the food between their fore-feet. They never appear by day, neither do they commit depredations within doors. I have observed their manners by night, in moonlight nights, taking my station on a plain, and remaining for some time with as little motion as possible. I was soon surrounded by hundreds at the distance of a few yards; but on rising from my seat the whole disappeared in an instant, nor did they venture forth again for ten minutes after, and then with much caution and circumspection.

"A tribe of low Hindus, called Kunjers, whose occupation is hunting, go in quest of these animals at proper seasons, to plunder their hoards of grain, and often, within the space of twenty yards square, find as much corn in the ear as could be crammed into a common bushel. They inhabit dry situations, and are often found at the distance of some miles out of the reach of water to drink. In confinement this animal soon becomes reconciled to its situation, and docile; sleeps much in the day, but when awake feeds as freely as by night. The Hindus above mentioned esteem them good and nutritious food."

There are many other species of Jerboa, as the *D. Mauritanicus* of Algeria; *D. jaculus*, *D. hirtipes*, and *D. bipes*, of Egypt; *D. telum* of Tartary; *D. lagopus* of Bokhara; *D. brachyurus*, *D. minutus*, *D. platurus*, of Russia. F. Cuvier mentions the *Alactaga arundinis* of Algeria, and Gray a species of *Alactaga* in India. A species has also been discovered in Australia by Sir Thomas Mitchell, which has received the title of *D. Mitchellii*. It is of small size, and in other respects resembles the Jerboas we have described. The *Canada Jumping-mouse* has sometimes been called a jerboa, but America has no true species of this genus.



THE CAPE HELAMYS.

THE PEDETIENS.

This tribe consists of two genera, the *Pedetes* and *Petromys*.

Genus PEDETES: *Pedetes.*—These animals have a large head, a long body, long pointed ears, large eyes, and long hind-legs used for leaping, as in the jerboa.

The Helamys, *P. Capensis*, is the Grand Gerbo of Allamand; *Spring-Has*, or *Jumping-Hare* of the Dutch; and *Aerdmannetje* of the Hottentots; the *Dipus Caffer* of Gmelin and others. It

is of a bright yellowish-tawny color above, varied with blackish; white below, with a line of the same color in the fold of the groins; legs brown; tail reddish above at its origin, gray below, and black at the tip; length from the nose to tail about one foot two inches; of the tail, near fifteen inches; of the ears, three inches. It is a native of the Cape of Good Hope, where it sleeps during the day, going forth by night; it moves by jumps on its hind-legs, like the jerboa, often leaping twenty or thirty feet at a bound. It eats sitting nearly upright, with the hind-legs extended horizontally, and using the small fore-feet to bring the food to its mouth. It feeds on vegetables, and is excessively timid, burying itself in its burrow upon the slightest alarm. It is a very strong animal, and with the fore-feet, which are admirably formed for digging, burrows so expeditiously as quickly to hide itself.



THE PETROMYS TYPICUS.

Genus PETROMYS: *Petromys.*—These animals move upon the hind-legs, which are not much larger than the fore-ones; the tail is nearly as long as the body. One species only is known, the Rock-Rat, *P. typicus*, which is but about seven inches long, and the tail five and a half inches; it is of a reddish color, and builds its nest among the stones and in the crevices of the rocks. It is found in southwestern Africa, in the region of Orange River.

THE CTENODACTYLIENS.

These consist of the single genus *Ctenodactylus*, and the single species *C. Massonii*, of the size of a small rabbit, of a gray color, with a short tail, and found in Southern Africa.

THE MYOXIDES.

Of this family the *Dormouse* is the type, and constitutes the principal member of the genus. All the species belong to the Eastern Hemisphere.

Genus MYOXUS: *Myoxus*, the *Loir* of Gervais: this comprises the Dormouse or Sleeper of the English: *M. avellanarius* of naturalists. It is the *Muscardin*, *Croque-Noix*, and *Rat-d' Or* of the French; *Moscardino* of the Italians; *Liron* of the Spanish; *Rothe Wald-Maus*, *Hasel-Maus*, and *Hasel-Schläfer* of the Germans. It has been placed by some naturalists among the squirrels, which it resembles in its form and appearance. It is the smallest species in the genus, being about three and a half inches long, and the tail of equal length. The head is rather large, the eyes large, black, and prominent; muzzle not blunt; ears broad, about one-third the length of the head; body plump and round; tail flattened, the hairs rather long and bushy; head, back, sides, belly, and tail, tawny red. Its favorite retreats are dense thickets, bushy dells, and tangled hedgerows, though it sometimes lives in the forests. There it constructs its easy dormitory, and there providently lays up its winter store, consisting of acorns, beech-mast, corn, young hazel-nuts, haws, &c. It seems inclined to be gregarious, ten or a dozen, or even more, of their nests being



THE DORMOUSE.

usually built in the shrubs of a thicket or wood. It climbs trees, and often makes its nest in the fork of a tree or shrub.

It takes its food holding it in its hands, and sitting on its haunches like a squirrel, and often suspends itself by its hind-feet, in which position it feeds as easily and comfortably as in the more ordinary attitude. Toward the winter it becomes exceedingly fat, and having laid up a store of food, retires to its little nest, and coiling itself up into a ball, with the tail over the head and back, becomes completely torpid. A mild day occasionally calls it into transient life; it then takes a fresh supply of food and relapses into its former slumber; and finally awakening in the spring, at which time it has lost much of its fat, it enters upon its usual habits, and the enjoyment of the conjugal and parental affections. The young, which are generally about four in number, are born blind; but in a few days the eyes are opened, and in a short time they are enabled to seek their food independently of the parent's care. There is reason to believe that, in some cases at least, the dormouse has a second brood early in the autumn. It is nocturnal in its habits.

We are told that a dormouse having been taken in its nest in the middle of December, the heat of its captor's hand and the warmth of the room completely revived it, and it nimbly scaled the furniture, finding no difficulty in ascending and descending the polished backs of the chairs, and leaping from chair to chair with great agility. On being set at liberty it sprang at least two yards to a table. It did not seem alarmed at being taken into the hand. In the evening it was placed with its nest in a box, and the next morning had relapsed into torpidity. Another account informs us that a dormouse, which had been sent a distance of one hundred and forty miles, was apparently but little disturbed by its ride. From that time till the first of April, it slept in its snug dormitory, a deal-box lined with wool, when it awoke, and readily ate of apples and nuts. It was easily alarmed, being more timid than tame, but showed no signs of anger on being taken in the hand. As it slept the greater part of the day, its habits could not then be studied; but toward evening it woke up, and was very lively and frolicsome, running, on being let out of its cage, up the bell-rope, where it would sit for hours in the folds of the knot, timidly watching the movements of the persons around. It is found all over Europe, and is common in England, where the other species are not found.

Gervais notices as a distinct species of Dormouse the Loir Glis, *M. Glis*, which he describes as being five inches long, with a tail four inches, and found in Greece, Italy, Spain, France, and



THE GLIS.

Austria. This he considers as probably the *Glis* of the ancients, noticed by Aristotle, Pliny, and others. Its flesh seems to have been relished by the Romans, who fattened it for food, Varro having left instructions how to build warrens for it, and Apicius how to convert it into ragouts. The moderns, however, find it rank and offensive. Other authors consider the common dormouse, above described, as the *Glis*, and do not notice the *Loir Glis*, now under consideration.



THE CAPE GRAPHIURE.

The Lerot, or Garden Dormouse, *M. nitela*, is a native of the temperate portions of Europe, and is found as far north as Poland and Prussia. It is five inches long, the tail four inches; the color is reddish-gray above and white beneath. Gardens, orchards, and vineyards are its favorite

resorts, where it makes sad havoc, especially among the wall-fruits, peaches, pears, apricots, &c. Its winter store consists of nuts, peas, beans, and the like. These are collected in some hidden recess, where ten to twelve individuals assemble to pass their winter's sleep. The summer nest is made in cavities in walls or holes in trees. The young are four or five in number.

Other species of Dormouse are as follows: the DRYAD DORMOUSE, *M. dryas*—the *M. nitedula* of Pallas, found in the forests of the Caucasus, and in the valley of the Volga, held by some to be a variety of the Lerot; the *M. orobinus* of Sennaar; the *M. Coupeii* of Senegal; the *M. murinus* of the Cape of Good Hope and Mozambique. These African species constitute the genus *Eliomys* of Wagner. The *M. elegans* or *M. lineatus* is found in Japan.

Genus GRAPHIURE: *Graphiurus.*—Of this two species are named: the CAPE GRAPHIURE, *G. Capensis*, resembles the dormouse in appearance; it is of a grayish-brown, and of the size of the Lerot; its habits are not known. It was discovered at the Cape of Good Hope by M. Catoire. Ogilby notices a second species under the name of *G. elegans*, also of Southern Africa.



THE BLACK RAT.

THE MURIDÆ.

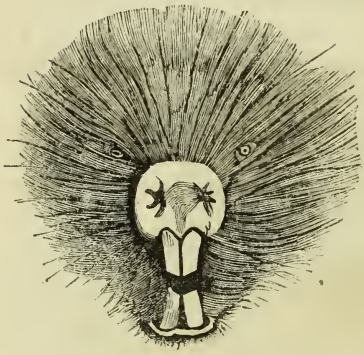
The MURIDÆ, deriving their name from *Mus*, a rat or mouse, form the most extensive family of all the rodents, comprising, when taken in its largest sense, a great number of genera and species, which, though none of them attain to any considerable size, become worthy of serious notice from their prodigious multiplication, and the destructive influence which they exert over vegetation and the fruits of the labor of the agriculturist. The type of this family is found in the genus *Mus*, to which our common rats and mice belong. Their general characteristics are that the tail is more or less elongated, and usually naked; the eyes are of moderate size, and the external ears distinctly developed; the hind-legs are the longest, and possess five complete toes, while the anterior feet have only four toes and a sort of wart, which represents the thumb; the lower incisor teeth are narrow and pointed; the angle of the lower jaw is rounded, and the clavicles are complete. These animals generally hold their food in their fore-paws while they eat, sitting upon their haunches during the operation. They are all burrowing animals, and most of them

swim well. The species are not only exceedingly numerous, but very generally distributed in all parts of the world; some are even indigenous to Australia. Under this head we shall first notice the tribe of *Rat-Moles*, and then the *Muriens*, of which the principal types are the *Field-mice* and common *Rats* and *Mice*.

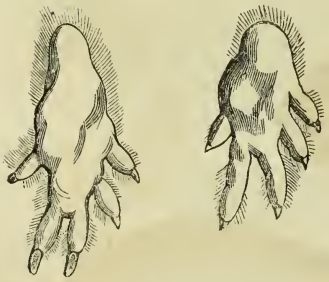
THE RAT-MOLES.



HEAD OF HELIOPHOBIUS.



FACE OF HELIOPHOBIUS.



FEET OF HELIOPHOBIUS.

This tribe are all burrowers, have a large head, the tail short or altogether wanting, and the eyes very small. There are several genera, as *Bathyergus*, *Georychus*, *Rhizomys*, *Siphneus*, *Spalax*, and *Heliophobius*.

Genus HELIOPHOBIUS: *Heliophobius.*—Of this there is a single species, *H. argenteus*, which is the only one of the Rodentia which has five pairs of molars in each jaw. It is little known beyond its appearance; it is of a silver-gray color, and has a head and feet not easily described, and of which we therefore present engravings.

Genus BATHYERGUS: *Bathyergus.*—These animals, belonging to Africa, have no external ears; they have extremely small eyes, a short tail, and a squat body; they burrow and form galleries, like the moles, in sandy wastes, generally near the sea. These are the proper *Rat-moles*. There are several species, as follows:

The Coast Rat, or Cape Mole, the *Great Cape Mole* of Buffon, the *Zand Moll* of the Dutch, and *Kauw-Houba* of the Hottentots, *B. maritimus*, is nearly the size of a rabbit, being thirteen inches long, and its tail a little more than one inch. It perforates the earth with its long, horizontal galleries in such a manner that persons often break into them and sink up to their knees, and rendering it exceedingly dangerous to ride among them. It lives on roots and bulbs, and is found in the region of the Cape of Good Hope, especially in the sand-flats near the sea. It is of a reddish-gray color.

The Hottentot Bathyergus is of a brownish-gray, and is half the size of the preceding; this also is found near the Cape. Two other undescribed species are mentioned by naturalists: one is called *B. Buffonii;* the other is yet unnamed.

Genus GEORYCHUS: *Georychus.*—Of this there is a single species, the *G. Capensis*; this is five inches long, with a tail two-thirds of an inch. It lives in burrows, and generally resembles the Bathyergus. It is found in South Africa.

There are several species of field-mice, arranged under this genus by some authors, which we shall notice under the head of Lemmings.

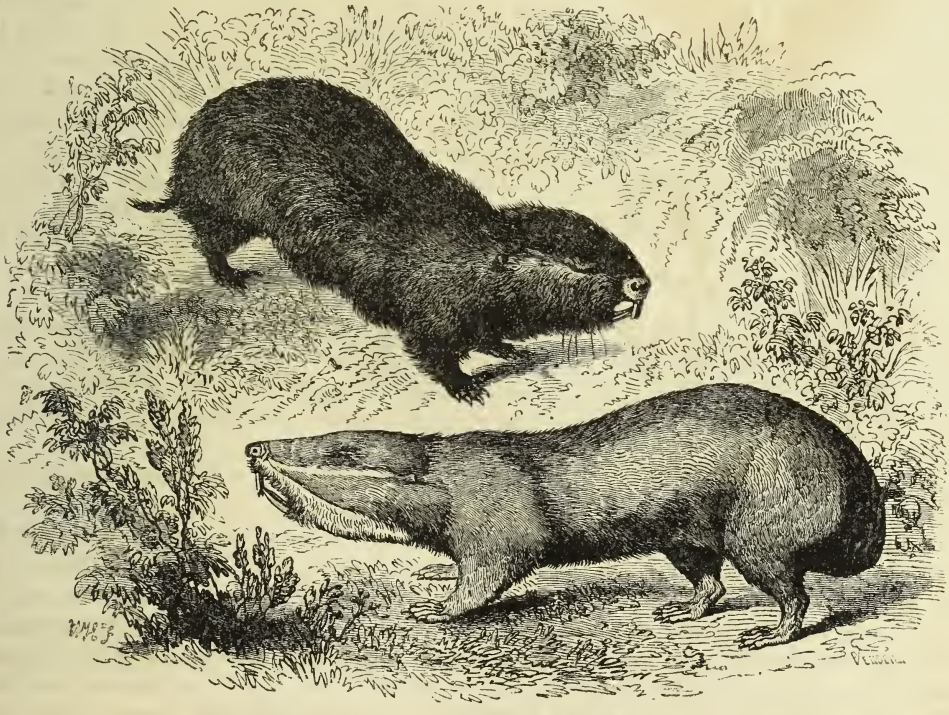
Genus RHIZOMYS: *Rhizomys.*—These animals have a long body, small eyes, and short tails, and resemble the rat-moles. A single species only is well known, the Bamboo-Rat, *R. Sumatrensis*, the body of which is thirteen or fourteen inches long, and the tail five; the general color is a light yellowish-gray; it has been erroneously referred to Sumatra and Java; its true habitat is in the dense and almost impenetrable bamboo thickets of Malacca. It feeds on the young roots of that plant, and on various fruits. It lives in burrows, from which it only issues at night. This animal is described by Temminck under the name of the *Deccan Nyctocleptes*, and is probably the same as the *R. Chinensis* of Gray. The *Mus talpinus*, of Pallas,



THE MALACCA RHIZOMYS.

has been referred to this genus, and Hodgson speaks of a species found in Nepaul; but neither of these has been sufficiently described to be positively arranged under this head.

Genus SIPHNEUS: *Siphneus.*—Of this a single species only is known, the ZOKOR of Southern Russia, *S. zokor*, the *Mus spalax* of Pallas, chiefly found in the steppes of the Irtish. It forms subterranean galleries, like the moles, and feeds on roots and bulbs. It is of a grayish-red color, and is eight inches long.



BATHYERGUS. THE ZEMNI.

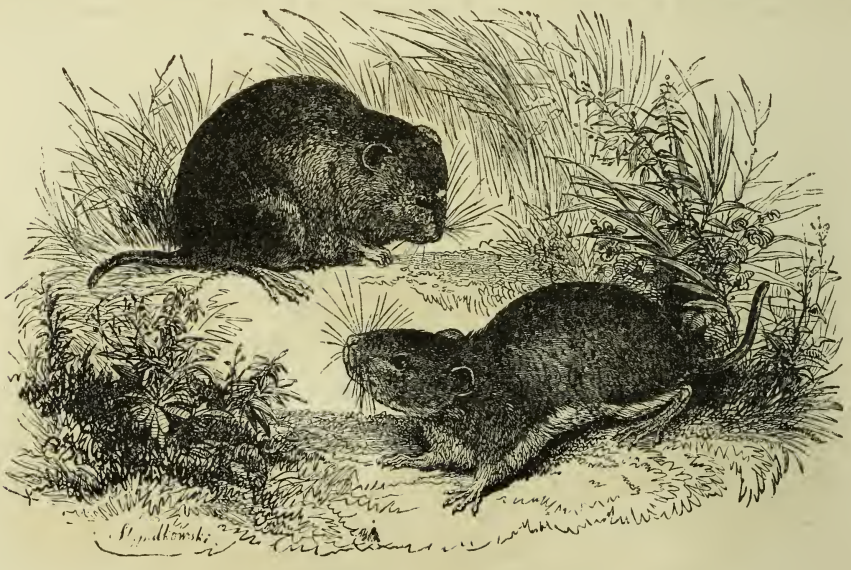
Genus SPALAX.—Of this but a single species is well known, but it is one of the most remark-

able creatures in the whole circle of mammalogy. This is the ZEMMI or ZEMNI, *S. typhlus*, the *Mus typhlus* of Pallas; the *Podolian Marmot* of Pennant; the *Blind Rat* of Shaw. Its length is about seven or eight inches, there being no tail; the head is broader than the body; no aperture for the eyes, which, no bigger than poppy-seeds, are hid beneath the skin, so that the animal is entirely destitute of the sense of sight! There are no external ears; the end of the nose is covered with a thick skin; nostrils very remote, and placed below; limbs very short; claws short; hair or fur short, thick, and very soft, dusky at the bottom and cinereous-gray at the tip; space about the nose and above the mouth, white. In compensation for its want of sight, it is said that the hearing of the spalax is very acute.

This species, which is no doubt the spalax of Aristotle, and which he found to be without the power of vision, the Russians name *Slepez* or the *Blind*, and the Cossacks *Sfochor Nomon*, signifying the same defect; it burrows extensively beneath the turf, driving at intervals lateral passages in its search for roots, particularly that of the bulbous *Chærophyllum*. Openings to the surface occur at distances of some yards from each other, and there the earth is raised into hillocks, sometimes of two yards in circumference, and of considerable height. It works stoutly and rapidly, and on the approach of an enemy instantly digs a perpendicular burrow. Though it cannot see, it lifts its head in a menacing attitude toward an assailant, and, when irritated, snorts and gnashes its teeth, but emits no cry: its bite is very severe. In the morning it often quits its hole, and during the season of love basks in the sun with the female. It is worthy of notice that there runs a superstition in the Ukraine that the hand which has suffocated one of these animals is gifted with the virtue of curing scrofula or the King's Evil, in the same way that it was supposed to vanish before the royal touch of the Stuarts in England.

It is found in the southern parts of Russia, from Poland to the Volga, but not to the east of that river; it is common from the Sysran to the Sarpa, and frequent along the Don, even to its origin, and about the town of Rœsk, but not in the sandy parts.

It is supposed that two other species exist, but they are not authentically described.



SHORT-TAILED FIELD-MICE.

THE MURIENS, OR RATS AND MICE GENERALLY.

This tribe is more numerous in species than that of any other among the mammals, and though considerable differences exist among them, they all possess the general characteristics of Rats or Mice.

Genus LEMMING: *Lemmus.*—Of this there are several species, the most celebrated of which is the LAPLAND LEMMING, *L. Norvegicus.* This is confined to Lapland and Norway. It is

about seven inches long, with a tail half an inch. It burrows in the earth, making its nest of moss; from four to eight young are produced twice a year; its color is yellow, variegated with black. It is sometimes called the *Norway Rabbit*. It is celebrated for its occasional migrations —that is, once in four to ten years—in immense numbers. They proceed in a straight line, a few yards apart, each one usually tracing a shallow furrow in the soil as he goes. They devour all the herbs and roots in their passage. If they come across a man they glide between his legs; if they meet with a hay-stack they gnaw through it; if they come to a rock they go round it in a semi-circle, and then resume the straight line of their march. On coming to a lake or river, or an arm of the sea, they swim directly across; if they encounter a boat they climb over it, so as not to be diverted from their advance in a direct line. It is curious that they avoid the habitations of men. They proceed by night and halt by day. Woe to the place where they stop, for in a few hours meadows, gardens, and corn-fields are dry and barren as if scorched by fire. As they take the inhabitants by surprise, no effectual defense can be offered. They resist fiercely, and will bite the stick or hand that removes them, crying and barking like little dogs, when defending themselves. Multitudes of them are, however, destroyed in their progress by man.

It is asserted that among them a female may be often seen with one young one in her mouth and another on her back. The number that proceed in this manner is beyond computation. They descend in two directions from the Scandinavian Alps, which are their native home, one stream directing its march from east to west toward the North Sea; the other from west to east toward the Gulf of Bothnia. After a time they set out to return, but their numbers are so reduced that they are scarcely observed. Very few survive to reach the mountain homes from which they departed. The cause of these migrations is utterly inscrutable. They seem to proceed from some instinct that acts like an uncontrollable destiny, urging them on through difficulty, danger and suffering to an inevitable doom. In general, the instincts of animals are seen to be founded in truth and reason, and to conduce to the advantage of the creatures on whom they act; but in this case it seems like an hallucination, and ends in destruction. The migrations of the gray squirrels of the United States have some analogy to these we are describing, but they



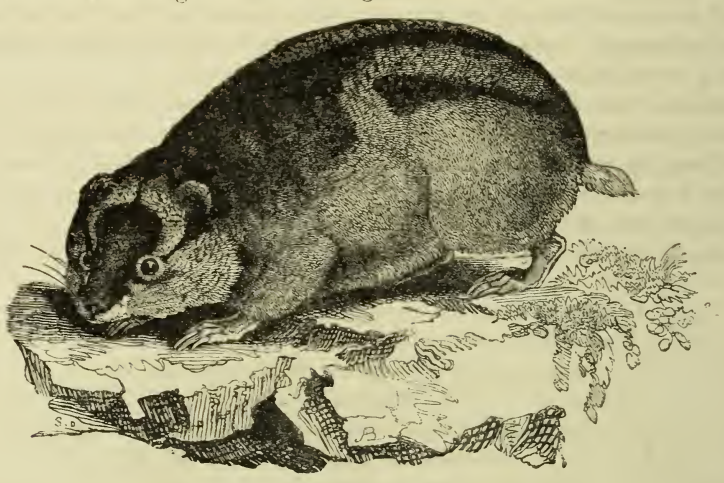
THE LAPLAND LEMMING.

may reasonably be supposed to be the result of a general necessity in respect to food; but no such explanation is possible in respect to the Lapland Lemmings. It has been suggested that by a mysterious but still prophetic instinct, they are advised of the approach of a winter of unusual severity, and that they migrate to avoid it. Thus it is stated, that in 1742 a vast migra-

tion took place in Norway from the Circle of Umea to that of Lula, and that the winter accordingly was very severe in the former and mild in the latter, though this was farther to the north. But if this be so, still the instinct only leads to destruction; for even if they find a milder climate, as we have shown, they only go to their ruin. An instinct which leads a whole tribe of animals —millions in number, and at frequent intervals—through fatigue, wounds, privation, and anxiety, to premature and violent death, does not seem to be beneficent, and in its result, in this sense, is a direct contradiction of its motive. Such are not usually the ways of Providence.

Pallas includes two other species of Lemming under the generic name of *Myodes;* there are the *M. lagurus* of Central Asia, and the parts of Europe nearest to it, and the *M. torquatus* of Northern Russia. Nilsson names a species which he calls *Lemmus semitricolor*, in the same division.

There are several species of Lemming in North America, described by some naturalists under the generic name of *Georychus*. The Hudson's Bay Lemming, the *Hare-tailed mouse* of Hearne and *Mus Hudsonius* of Pallas, the *Arvicola Hudsonia* of Richardson, is five and a quarter inches long, the tail half an inch; color, reddish-brown in summer and white in winter. In summer it burrows in the ground, usually beneath stones and in dry ridges; in winter it inhabits a nest of moss upon the ground, and seldom ventures abroad. It is an inoffensive creature, and on being captured becomes tame and gentle and as fond of being caressed as a kitten. It is a native of Sahara and the contiguous northern regions.



THE TAWNY LEMMING.

The Tawny Lemming, the *Arvicola helvolus* of Richardson, is smaller than the preceding, and resembles the Lapland Lemming. It is found about latitude 56° in mountainous districts of the northwestern British territories.

Back's Lemming, *Arvicola trimucronatus* of Richardson, is five inches long, with a tail half an inch; it is found near the Great Bear Lake.

The Greenland Lemming, *Mus Grœnlandicus* of Richardson, is about six inches long, and is found in the polar regions of North America.

Genus ARVICOLA: *Arvicola.*—This word is derived from the Latin *arvum*, "a field," and *colo*, "to inhabit," and embraces the numerous species of *Field-Mice*. It is equivalent to the term *Campagnol* of Gervais and other French authors. The word *Vole* is popularly applied to many of the species, as "*Field-Vole*," "*Water-Vole*," &c. These animals are of small size, have a short tail, burrow in the earth, feed on grain, bulbous roots, and grasses, and neither climb trees nor become dormant in winter. They inhabit every quarter of the globe. About forty species are known, one-half of which are natives of North America.

The Common European Field-Mouse, or Short-tailed Field-Mouse; the *Campagnol* of Buffon—*A. arvalis*—the *Mus arvalis* of Linnæus, is of the size of the common mouse; ears long, eyes prominent, tail one-quarter the length of the body, color a yellowish-fawn mixed with gray. It is subject, however, to varieties of color, some being black and others white, and others still a

yellowish-white; some are also marked with white on the ordinary color. It is common in all parts of Europe, and despite its small size, is the scourge of the farmers. It lives in cultivated plains, especially in the grain-fields. In summer it attacks the cereals, cutting down the stalks to get the ears; when these are harvested it eats the roots of grass, and especially those of the young clover; it then makes an onslaught upon the carrots and other leguminous vegetables; when autumn approaches it devotes itself to the seeds. When the earth is frozen it migrates to the barns, and revels among the hay and grain. Some seasons—that is, about once in five years—the numbers are so great as to become devastating to the harvests; at other times they are more rare. It has been estimated that in La Vendée, in France, during the years 1816 and 1817, they destroyed crops to the value of three millions of francs, and they were equally destructive in some other parts. They are very unequally distributed, in some places being abundant, in others sparsely scattered over the country. Italy is said to be the only part of Europe where they are not found. They extend into Siberia as far as the Obi. They are most common in the plains, but are found in mountainous countries, even so high as the hospital of Mt. St. Gothard, 6,000 feet above the level of the sea. This little creature is gentle, soft, graceful, but as it feeds on the same things that man feeds on, and as, moreover, it takes without liberty the fruits of man's labor, it is everywhere an object of hatred. Millions of them are destroyed by the inundations which take place in countries traversed by mountains, and other millions are destroyed by the agency of man. Small and insignificant as it is individually, on account of its immense numbers it forms the staple article of food to innumerable hawks and herons, cats, weasels, owls, and other flesh-eaters; and thus it performs a considerable part in the great theater of animal life.

The *A. agrestis*, called *A. neglecta* by Thompson, and *A. arenicola* by Selys, is a large species, found in Scotland and the northern parts of Europe. This is to be distinguished from the *A. agrestis* of the Penny Cyclopedia and other authorities, which give this title to the *A. arvalis*.

The *A. fulvus* is of the size of the preceding, and is sometimes found mingled with it. It is a native of the western parts of France and of Belgium. The *A. incertus*, *A. Selysii*, *A. glareolus*, *A. Nageri*, *A. Savii*; the *A. subterraneus*, *A. socialis*, *A. œconomus*, *A. duodecim costatus*, *A. rubidus*, *A. leucurus*, *A. nivalis*, and *A. terrestris*, are all European species, bearing a general resemblance to the common field-mouse, but less numerous and less generally distributed.

The Water-Rat, or Water-Vole, *Mus amphibius*, or *aquaticus*, is about the size of the black rat, from which it is easily distinguished by its larger head, its shorter tail, and its more rufous tinge. It is about five inches long, and the tail half that length. Its fur is soft, and of a slightly reddish-brown above and deep ash-color below; the tail is covered with rough scales. It is fond of the water, and swims well, though its feet are not palmated. It is found along the borders of rivers, lakes, and streams, as well as of bays and lagoons connected with the sea. It breeds twice a year, and produces six to eight at a birth. It feeds on vegetables, and is found in various parts of Europe.

The *A. destructor*, or *A. Musignani*, is of the size of the preceding, and differs from it but little in appearance. It is common in Italy, and especially in Tuscany, where it is a national pest. It is said that in 1837-8 this species being driven from their retreats by inundations in this country, spread themselves over the cultivated lands and destroyed four-fifths of the crops. When an attempt was made by the government to redeem the Maremma marshes by dykes, these creatures presented almost fatal obstacles by eating the roots of the trees and shrubs planted upon them in order to protect them. The *A. monticola* resembles the preceding, and inhabits the Pyrenees.

We now proceed to notice very briefly the common species of American Arvicola. Wilson's Meadow-Mouse, *A. Pennsylvanica*, is brownish-fawn above and grayish-white beneath; fur long and fine; length five inches, tail one and three-quarters. It is found in all the meadows of the United States, where it traces winding, shallow paths in the earth among the grass leading to and from its nest, usually in a stump, or some little elevation along a ditch. If the soil is here dug up, the mouse and its family of six to ten individuals may be found. The food of this species consists of roots, bulbs, grasses, and in the season, of seeds, those of the red-top and herds-grass being among its favorites. It does not invade the upland grain-fields, but when the winter has destroyed or locked up the roots on which it usually subsists, it attacks the stems of shrubs and fruit-trees, and

thus does some damage to the farmers, wherefore—though it is a very pretty, soft, gentle, and well-meaning creature—it is held in disesteem by that large and influential class of persons.

This species, which is rather nocturnal in its habits, builds its nest near the surface of the ground, and brings forth from two to five at a birth. The young sometimes adhere to the teats of the mother, and she may be seen thus dragging them along on the ground. They live in low grounds, and do not visit dwellings or outhouses, at least in the United States, though they are said to do so in Canada. They are easily tamed, and in this state, sit on their haunches and comb and clean their fur, and come to the bars of their cage for food. This, as well as all other species of mice, are devoured in large numbers by owls, hawks, and various kinds of small carnivora.

The Yellow-cheeked Meadow-Mouse, *A. xanthognatha*, is eight inches long, dark brown on the back and silvery-gray beneath, lives in low grounds, and burrows in banks near ponds and water-courses, and makes long galleries; it is partially nocturnal, and feeds on roots and grasses. It is found in Labrador and around Hudson's Bay.

Drummond's Meadow-Mouse, *A. Drummondii*, is a little over four inches long, and is found in the valleys of the Rocky Mountains.

Baird's Arvicola, *A. austerus*, is five and a half inches long, and inhabits the State of Wisconsin.

The Northern Meadow-Mouse, *A. Borealis*, is four and a half inches long, and lives near the Great Bear Lake.

The California Meadow-Mouse, *A. edax*, is five and a half inches long, and is found in California.

The California Arvicola, *A. Californica*, is somewhat larger than the preceding, and is found in the same region.

The Western Meadow-Mouse, *A. occidentalis*, is a trifle over four inches long, and is found in Oregon.

The Jersey Field-Mouse, *A. campestris*, is three and a half inches long, and is found in New Jersey.

The Sonora Field-Mouse, *A. Sonoriensis*, is three and a quarter inches long, and is found in Sonora.

The Red-sided Field-Mouse, *A. rubricatus*, is found on the shores of Behring's Straits.

The Glossy Field-Mouse, *A. De Kayii*, is three inches and three-quarters long, and is found in the western part of the State of New York.

Woodhouse's Field-Mouse, *A. apella*, is four and a half inches long, and is found in Pennsylvania.

The Oregon Meadow-Mouse, *A. Oregoni*, is a very minute species—three inches long—and is found near the Columbia River, in Oregon.

Peal's Meadow-Mouse, *A. montana*, is four and a half inches long, and is found in California.

The Sharp-nosed Arvicola, *A. nasuta*, is five inches and three-quarters long, and is found from Massachusetts westward to Michigan.

The Rice Meadow Mouse, *A. orizivora*, is five inches long, and lives in the rice fields of Georgia and South Carolina.

Richardson's Meadow-Mouse, *A. Richardsonii*, is seven inches long, and is found near the foot of the Rocky Mountains.

The *A. Texana* is but a trifle over two inches long, and is found near El Passo.

The Texan Meadow-Mouse, *A. Texiana*, is four and a half inches long, and is found in Texas, along the rivers Brazos and Grande.

Leconte's Pine-Mouse, *A. pinetorum*, has some resemblance to Wilson's Field-Mouse, and is found in some of the Atlantic States.

Genus ONDATRA: *Ondatra.*—Of this there is a single species, the well known Muskrat or Musquash, *O. Zibethica*, the *Castor Zibethicus* of Linnæus, found only in North America. Its head, neck, and legs are short, and its thighs hid in its body. Its length is fifteen inches, its tail ten; its color reddish-brown above and ashy gray beneath. The fur is short and downy, and was formerly much used as a substitute for beaver; it is still in demand, and the animal is every-



THE MUSK-RAT.

where more or less an object of pursuit. It is endowed with a strong musky smell, but not very offensive; the flesh is tolerable food. It lives along the banks of ponds and rivers, somewhat in the manner of the beaver, building its winter-houses of mud in a conical form, with an entrance under water and a dry chamber above. It is a good swimmer though its feet are not webbed. In summer it digs burrows along the banks of lakes and streams, forming branched canals many yards in extent, and making a nest at the extremity, where the young are produced —three litters in a season, and three to five at a time. It may be observed that their modes of building, burrowing, and living, vary considerably in different localities—a fact no doubt owing to the varying necessities of their situation. Their food consists of grasses, roots of various kinds, tender shoots of the bulrush, and reed-mace, acorns, spice-wood, and sometimes, when dwelling near human cultivation, turnips, parsnips, and carrots; they also occasionally eat mussels. In winter, when hard pressed, they sometimes devour each other; when one is wounded the rest set to and eat him.

This is doubtless a dark streak in their character: for the rest, they are mostly a gentle folk, pursuing their avocations by night, in a manner so quiet that they seldom intrude on the notice of mankind. They are of a sportive humor, and in the mild season, when the lakes and ponds are open, they may be seen—especially if moonlight favors the observation—disporting on the surface of the waters, swimming, diving, and circling, with all the frolicsome humor of children. While some thus give themselves up to merriment, others are occupied in the graver but not less agreeable task of finding their food along the banks. It is said that one of them, at such a time, seated on a bank, looks exceedingly like a ball of earth. It is noticed, too, that in diving, they make a smart stroke of the tail in the water, which seems to be an imitation of one of the tricks of the beaver. They do little damage to man, except in a few cases, when they dig up the borders of streams and ditches, yet on account of their fur they are objects of ceaseless persecution. A multitude of devices are brought into requisition for their capture: they are sometimes caught in traps and sometimes shot with guns; they are dug out and seized by dogs; the Indians spear them in their beds. They are found throughout the Atlantic States in more or less abundance, and are distributed northward through the British territories to the latitude 69° north. In the far Northwestern regions large numbers are taken by the Indians, who make the hunting of them a part of the business of their lives. Several hundred thousand skins are annually obtained.



THE HAMSTER.

Genus CRICETUS: *Cricetus.*—The animals of this genus greatly resemble the true rats. The most noted species is the EUROPEAN HAMSTER, *C. frumentarius* of Pallas. It is of a reddish-brown color above; black below, with three large whitish spots on the sides; feet white; a white spot on the throat, and another on the breast; but variations in color are not uncommon, one variety being black. The length is about nine inches; tail three inches. It is supplied with ample cheek-pouches, and is distributed over the most of Europe and Asia.

The hamsters are serious pests to the farmers. The quantity of grain which they consume is enormous, nor does the destruction stop with satiety of appetite; they never forget their hoards, and fill their two cheek-pouches till they seem bursting with the booty. They are also said to be very fond of the seeds of liquorice. Their dwellings are under the earth; their mode of constructing them being as follows: They first form an entrance, burrowing down obliquely; at the end of this passage one perpendicular hole is sunk by the male, the female sinking several: at the end of these they excavate various vaults—some as lodges for themselves and young, and some as storehouses for their food. Every young one is said to have its separate apartment; each sort of grain its different vault. The "living apartments," as they may be called, are lined with straw or grass. The vaults are said to be of different depths, according to the age of the constructor: a young hamster, it is stated, makes one scarcely a foot deep, an old one sinks to the depth of four or five feet. The whole structure is sometimes eight or ten feet in diameter.

From the mode of proceeding in their work, the reader will be prepared for the statement that the male and female live in separate apartments; and, indeed, it appears that, excepting at the short season of courtship, they have very little or no intercourse. Pennant gives them a very unamiable character. "The whole race," says that zoologist, "is so malevolent as to constantly reject all society with one another. They will fight, kill, and devour their own species, as well as lesser animals; and so may be said to be carnivorous as well as granivorous. If it happens that two males meet in search of a female, a battle ensues; the female makes a short attachment to the conqueror, after which the connection ceases. She brings forth two or three times in a year, and produces from sixteen to eighteen young ones at a birth: their growth is very quick, and at about the age of three weeks the old one forces them out of the burrows to take care of themselves. She shows little affection for them; for if any one digs into the hole, she attempts to save herself by burrowing deeper into the earth, and totally neglects the safety of her brood; on the contrary, if attacked in the season of courtship she defends the male with the utmost fury."

The harvest of these animals commences in August. Grains of wheat, ears of wheat, peas and beans in the pods, all find their way into their cheek-pouches, which will hold a quarter of a pint.

The forage is carefully cleaned in their burrows, and the husks and chaff carried out. When all is in order, they stop up the entrance and prepare for their hibernation, which lasts during the whole of the severe weather; the provision they have made having been collected for the purpose of their support before their torpidity actually commences, and also in the spring before there is a supply for them in the fields. If all tales be true, they are a bold generation, and will jump at a horse if he tread near them, and hang by his nose so as to be disengaged with difficulty. Their voice is said to be like the barking of a dog. Fierce as they are, they quail before their deadly enemy the polecat, which, chasing them into their holes, destroys them unrelentingly. Notwithstanding this check, they are so numerous in some seasons, in some places, as to occasion a dearth of corn. The fur of the animal is said to be valuable; and the peasant, when he goes "hamster-nesting" in the winter, not only possesses himself of the skin of the plunderer, but of the plunder, which sometimes amounts to two bushels of good grain in a single magazine. Buffon, quoting Sulzer, says that in Gotha, in Germany, where these animals were proscribed by the government, over 80,000 were captured in a single year.

Beside this notorious species other hamsters are found in Europe and Asia, as the *C. arenarius*, *C. phœus*, *C. accedula*, and, according to Brandt, *C. nigricans*. The Canada pouched-rat, *S. bursarius*, which we have described at page 415, is erroneously considered a hamster by Desmarest and F. Cuvier, who give it the title of *Cricetus bursarius*.



A GERBIL.

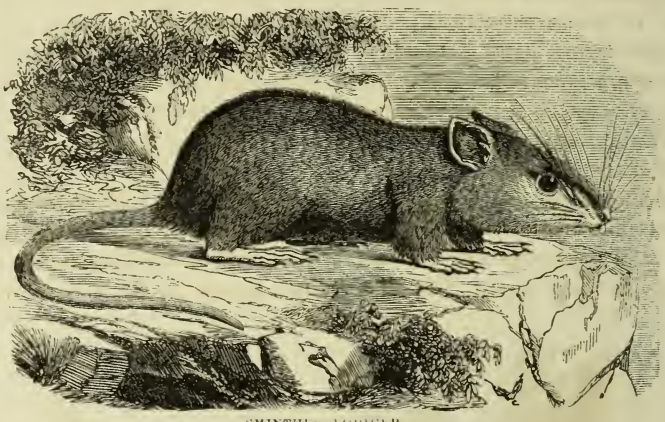
Genus GERBILLUS: *Gerbillus*.—Of this genus there are more than twenty species, all belonging to the Eastern Continent. They are somewhat rat-like in appearance, but are noted for the elegance of their forms, the length of their tail and hind-legs, and the lightness of their movements. Some live in cultivated districts; all burrow in the earth, where they hoard up provisions, and all are nocturnal in their habits. Their general color is fawn.

The Herine Gerbil, *G. Indicus*, confined to India, is eight or nine inches long, of a grayish fawn above, irregularly mixed with black; below it is white. It establishes itself in burrows near the grain fields, where it collects immense stores of barley and wheat, to which it has recourse during the dry season when the country is destitute of vegetation. It has, in common with several of the genus, an offensive smell.

Other species are the Tamaris Gerbil, *G. tamariscinus*, inhabiting the coasts of the Caspian; the Southern Gerbil, *G. meridianus*, the *Mus longipes* of Pallas, found in Southern Russia; the *G. opimus*, found in Europe and Asia, in the region of the Caspian; the *G. otarius*, found

in India; the Egyptian Gerbil, *G. Ægyptiacus*, the *Dipus Gerbillus* of Olivier; the Gerbil of the Pyramids, *G. pyramidum*, both found in Egypt; Burton's Gerbil, *G. Burtoni*, of Eastern Africa; the Short-tailed Gerbil, *G. brevicaudatus*, and the African Gerbil, *G. afer* of Gray, both of Southern Africa; the *G. pygargus*, of Upper Egypt and Senegal; Shaw's Gerbil, *G. Shawii*, of Northern Africa. There are other species, not fully described, in Algeria, bordering on the Desert of Sahara.

Genus PSAMMONYS: *Psammonys* of Rappel.—This comprises a single species, the *P. obesus*, the size of a common rat, resembling both the field-rat and the gerbil, and found in India and Arabia.



SMINTHUS LORIGER.

Genus SMINTHUS: *Sminthus.*—This contains the *S. loriger*—described by Nordmann—two and a half inches long, with a tail of nearly equal length. It is of a grayish-brown, with a black band running along the back. It is dormant in winter. The *Mus betelinus* of Pallas is referred to the same genus by Nilsson.



CAFFRARIAN OTOMYS.

Genus MERIONES: *Meriones.*—Under this term, used by Illiger as synonymous with *Gerbillus*, and which is equivalent to the *Jaculus* of Wagler, is included but a single species, the Labrador or Canada Jumping-Mouse, which is sometimes called the *Canada Jerboa;* it is the *Gerbille du Canada* of F. Cuvier; the *M. Labradorius* of Richardson; the *M. Americanus* of De

Kay; the *Dipus Americanus* of Barton; *Dipus Canadensis* of Davies, and *Canadian Gerbo* of Shaw. It is about two inches and a half long, with a tail four and three-quarters; the color is reddish-brown above and white beneath; its hind-legs are very long, and the fore ones short, as in the jerboa. It is found in the Atlantic States as far south as Virginia, and north to the latitude of 62°, but is nowhere abundant. It produces several times in the summer, three or four at a birth, and as in the case of some other mice, the female may sometimes be seen dragging her young by her teats along the ground. It feeds on seeds and grain, and is often met with in fields of wheat or rye, and is not unfrequently turned up by the plough of our farmers. It runs by long jumps or leaps, in a zig-zag manner, with great speed, on its hind-legs, putting its fore-legs to the ground at each bound. It lives in burrows, the nest being composed of fine grass mixed with feathers, wool, or hair, eight inches below the surface. Its haunts are usually in cultivated fields, though it is often met with in the woods. It is strictly nocturnal, lays up stores, and hibernates, becoming dormant in cold regions during the rigors of winter. It is on the whole a gentle, timid, minute creature, living often on the labors of man, but it is not so numerous or so greedy as to take beyond what he can well spare.

Genus OTOMYS: *Otomys.*—The animals of this genus, which is called *Euryotis* by Brandt, have the aspect of the true rats, but have larger ears and shorter tails. The Caffrarian Otomys, *O. unisulcatus*, is of a grayish-fawn, six inches long, with a tail two and a half inches. It is found at the Cape of Good Hope. The other species named are the *O. bisulcatus* and the *O. albicaudatus.*



CUMMING'S PHLEOMYS.

Genus PHLEOMYS: *Phleomys*, comprises a single species, resembling the *Capromys* in exter-

nal appearance, but having the distinctive organization of the *Muriens*. The only known species is Cumming's Phleomys, *P. Cummingii*, found in the Island of Lucon, one of the Philippines, where it is called *Parout* by the natives. It is a rare species, even in its native island, and its habits are little known. It is nine inches long, with a tail three inches, and is not only an animal of considerable size, but of vigorous character, defending itself from dogs and men with great savageness. It lives on roots and the shoots of plants, but does not dig burrows.



THE BROWN RAT.

Genus MUS: *Mus*—this word being the Latin for *Mouse*. We have already treated of numerous genera and a multitude of species which bear the general designation of *Rat* or *Mouse;* we now come to those to which these names more truly belong, and of which the domestic Rats and Mice are the types—animals possessing an energy of character which has carried their species over the whole globe. These consist of three well known species: the Common Mouse of our houses, *Mus musculus;* the *Souris* of the French; the *Maus* and *Hausmaus* of the Germans, and *Sorgio di Casa* of the Italians; the Black Rat, *Mus rattus;* the *Rat* of the French; *Ratze* of the Germans; *Rot* of the Dutch, and *Ratto* of the Italians; and the Brown Rat, *Mus decumanus;* the *Surmulot* of the French. While those we have described have been the comparatively gentle, timid eaters of roots, fruits, and seeds, living for the most part in houses of their own construction —some in meadows, some in fields, some in forests, but all apart from man, and all feeding on vegetables gathered by themselves, though occasionally from the treasuries of man—those we are now to notice are devourers alike of fish and flesh, fruits and vegetables; omnivorous in fact, and possessing at once the greediness, activity, cunning, audacity, and perseverance which have enabled them, while inciting the rage, to defy the vengeance of man, at the same time persisting in being his companions, living in his houses, feeding in his larders and granaries—in short, making him their servant and drudge—their steward, farmer, gardener, brewer, baker, butcher, and banker. "Where thou goest I will go; where thou dwellest I will dwell," is the practical language of the Rat and the Mouse to civilized man, and in spite of cats, terriers, traps, and ratsbane, they have for centuries fulfilled this devout and affectionate promise.

The Common Domestic Mouse is not indigenous to our continent, but was brought hither in European ships, after the discovery of America. The same is doubtless the fact in relation to the two species of *Rat* which infest our houses, the *Black Rat* and the *Brown Rat*, the latter called the *Norway Rat*. Historically, the mouse takes the precedence, figuring in the literature of remote antiquity, while the rat has been only known to modern times. The mouse is only mentioned incidentally in the Scriptures as unfit for the Hebrew to eat—that is in the Levitical law; but

it is introduced as a character in some of the ancient Grecian fables, and in the *Batrachomyomachia*, or "Battle of the Frogs and Mice," which is usually ascribed to Homer, and which is one of the best burlesque satires on wars and heroes that ever was written, we find them named after the different kinds of stores and provisions upon which they levied their contributions. In the original strife of these mighty combatants, the folly of the mice in being persuaded to go into the pond, for which nature had not fitted them, might forcibly bring to our mind the invasion of Russia by Napoleon, and the fatal consequences of his temerity. There is also something at once ludicrous and significant in the final destruction of the mice by the crabs, which are aquatic animals, and of the frogs by the storks, which are land ones. The fable of the Lion and the Mouse,* in which the monarch of the forest is compelled to beg of this little ani-



THE LION AND MOUSE—FROM GRANDVILLE.

mal to release him from the net of the hunter, is also full of point. Thus the ancients, if they were inferior to the moderns as zoologists, so far studied and understood the manners of animals as to draw from them useful moral lessons. The fables in which birds and beasts talked like men, have unfortunately fallen into disrepute in modern times, having given place to a coarse taste for caricature; but Grandville in France, and Landseer in England, have furnished the world with engravings of various animals—dogs and horses, wolves, foxes, bears, and tigers—in a manner to satirize the follies and vices of men through the similitudes of brutes, with even more humor than the written fables of Lafontaine, and quite as much effect.

The mouse is no less honored in Roman literature, for the poet Horace, in one of his most

* Lafontaine has modified the ancient Greek fable: he represents the royal lion as going forth, when a giddy mouse is near being trampled to death beneath his feet. The mouse pleads for its life, and the lion grants it. Afterward the lion, being caught in a net, is set at liberty by the mouse. The double moral is conveyed that we often need the assistance of those whose position is beneath our own, and that patient industry will often do more than mere strength.

agreeable compositions, gives us an amusing description of the Country Mouse, *Mus Rusticus*, showing his grave hospitality to his friend, the City Mouse, *Mus Urbanus*, the feast being held in a "poor hole," in the side of a rugged mountain. The moral of the story is somewhat Horatian, which is, that in this world of vicissitude it is best to be jolly when we can; a maxim, by the way, quite as wise and quite as virtuous as the rule of some people, deemed the salt of the earth, who think it is best to be always miserable.

The Common Mouse seems to have been indigenous to Europe, but it was first introduced here by the European emigrants some three centuries ago. It is now distributed over the world, wherever civilization and commerce have extended. It is one of the minutest of quadrupeds, being but about three inches long, with a tail a trifle shorter; it is also a soft, gentle, pretty animal. Buffon describes it with equal truth and felicity: "By nature timid, by necessity familiar, its fears and its wants are the sole springs of its actions. It never leaves its hiding-place but to seek for food; nor does it, like the rat, go from one house to another, unless forced to it; nor does it by any means cause so much mischief. When viewed without the absurd disgust and apprehension which usually accompany, or are excited by the sight of it, the mouse is a beautiful creature; its skin is sleek and soft, its eyes bright and lively; all its limbs are formed with exquisite delicacy, and its motions are smart and active."

The fecundity of the mouse is great, and readily accounts for its continued existence, distribution, and increase, despite all the devices of man, and even the employment of other animals, as cats, dogs, and ferrets, for its destruction. Aristotle tells us that he confined a female mouse in a vessel of corn, and not long after he found the number had increased to one hundred and twenty. Mice breed at all seasons, and several times in the year, producing from four to ten at a birth; even seventeen have been known to be produced. These are born blind and naked; they are at first little pink transparent things, three of which will go into a lady's thimble, but in fifteen days they are sufficiently advanced to take care of themselves. There are several varieties, one of which is white, with red eyes; this is a true albino, and its peculiarities being propagated by generation, many of them are bred for pets. Persons who have an instinctive horror of the common brown mouse have often a fancy for these *White Mice*. The mouse is said to be fond of music, and an instance is related in which one of these creatures, on hearing a man playing on a violin, ran out of its hole, scampered about the floor as if distracted, and after various antics, finally fell down dead.

We have alluded to the foolish dread which some people seem to have of the mouse. Captain Hall tells an anecdote of a tiger which he saw in a cage at Nagore, which shows that a similar dread is entertained by even that ferocious brute:—"What annoyed him far more than our poking him up with a stick, or tantalizing him with shins of beef or legs of mutton, was introducing a mouse into his cage. No fine lady ever exhibited more terror at the sight of a spider than this magnificent royal tiger betrayed on seeing a mouse. Our mischievous plan was to tie the little animal by a string to the end of a long pole and thrust it close to the tiger's nose. The moment he saw it he leaped to the opposite side, and when the mouse was made to run near him, he jammed himself into a corner, and stood trembling and roaring in such an ecstasy of fear that we were always obliged to desist from sheer pity to the poor brute. Sometimes we insisted on his passing over the spot where the unconscious little mouse ran backward and forward. For a long time, however, we could not get him to move, till at length, I believe by the help of a squib, we obliged him to start; but instead of pacing leisurely across his den, or making a détour to avoid the object of his alarm, he generally took a kind of flying leap, so high as nearly to bring his back in contact with the roof of his cage." It is possible that the observation of some such display on the part of a lion or tiger may have suggested the ancient fable of the Lion and the Mouse, to which we have already alluded.

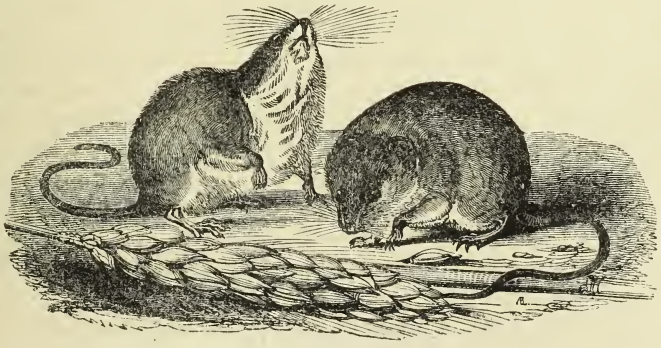
The Common Mouse is in America precisely what it is in Europe. We do not conceive it necessary, therefore, to give it a distinct notice.

Among the other European species of mouse belonging to this genus is the Long-tailed Field-Mouse, *Mus sylvaticus*, the *Mulot* of the French. This is somewhat larger than the common mouse, and also larger than the *Short-tailed Field Mouse*, the *Arvicola arvalis*, described at page 430,



THE LONG-TAILED FIELD-MOUSE.

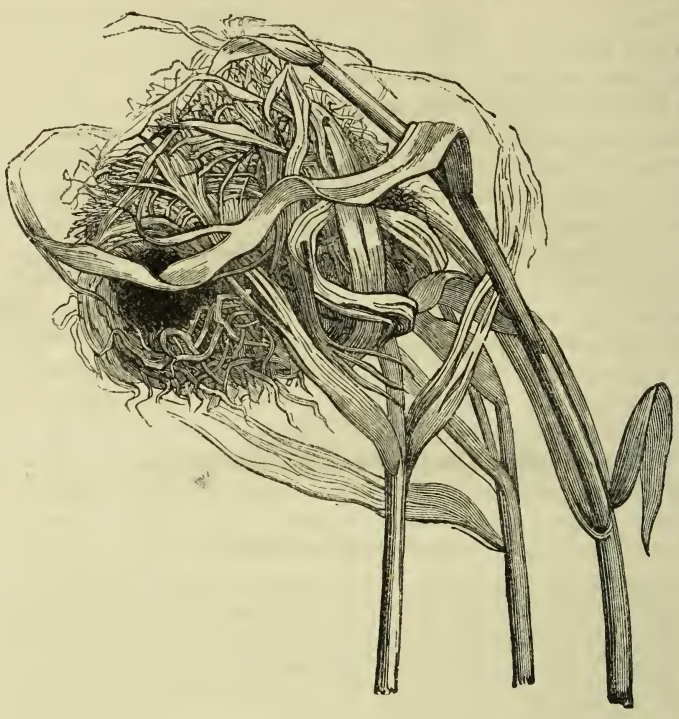
with which it is often confounded, it being four to five inches long, and the tail nearly the length of the body. Its color is a yellowish-fawn above and white below; the eyes are large and prominent; the ears large. It lives in the woods and fields in summer, but in winter resorts to the granaries. As the common mouse sometimes dwells in gardens, and even in fields and forests, so this species occasionally takes up its abode in houses. It is a most destructive species, and a great pest to the horticulturist, the agriculturist, and the planter. It is very prolific, bringing forth from seven to ten at a birth, and is not always stinted to one brood in a year. The hoards that it collects in its subterranean retreats—which are sometimes the results of its own labor, but more frequently excavations which it finds ready made, but which it enlarges, such as those under roots of trees, old mole-runs, &c.—are enormous for the size of the animal, and Pennant is of opinion that the great damage done by hogs in rooting up the ground is caused chiefly by the search of the swine for the concealed treasure of the Field-Mouse. It is an inhabitant of the whole of temperate Europe and parts of Asia.



THE HARVEST MOUSE.

The Harvest Mouse, *Mus minutus*, or *Mus messorius*—the *Rat Nain* of the French—the smallest of mice, and perhaps the very minutest of mammalia, an English half-penny weighing

down two of them,—lives in the fields and makes his little nest two or three feet from the ground on several standing stalks of wheat, bound together by grass. Dr. Gloger describes one of these nests as beautifully constructed of the panicles and leaves of three stems of the common reed, inter-



NEST OF THE HARVEST MOUSE.

woven together, and forming a roundish ball, suspended on the living plants, about five inches from the ground. On the side opposite the stems, rather below the middle, was a small aperture, which appeared to be closed during the absence of the parent, and was scarcely observable even after one of the young had made its escape through it. The inside, when examined with the little finger, was found to be soft and warm, smooth, and neatly rounded, but very confined; it contained only five young; but another which he found was less elaborately formed, yet it sheltered no less than nine. The panicles and leaves were slit into minute strips or strings by the teeth of the animal in order to assist the neatness of its weaving. Mr. Macgillivray found one of these nests in Fifeshire, composed of dry blades of coarse grass arranged in a globular form, and placed in the midst of a tuft of *Aira cæspitosa*, nine inches from the ground; it contained six or seven young, naked and blind. The food of this little mouse consists of corn and grass-seeds, insects and earth-worms. It is very prolific, and breeds in confinement, but in that case destroys its young. This species is distributed throughout the cultivated fields of Europe from France to Finland, and eastward to Siberia.

Among the other species of this genus in Europe are the following: *M. vagus*, found in Russia; *M. agilis*, in Germany; *M. agrarius*, in Germany and Russia; *M. Pecchioli*, in Southern Italy; *M. hortulanus*, in the Crimea; *M. leucogaster*, in Switzerland; *M. tectorum*, *M. frugivorus*, and *M. dicrurus*, of Italy.

The Black Rat and Brown Rat are doubtless both of Asiatic origin, but they are now better known and more widely distributed in other parts of the world, and especially in Europe and America. The ancient Greeks and Romans were not acquainted with either of these species. The Black Rat was introduced into Europe about the time of the Crusades, and the Brown Rat during the eighteenth century. Both these species are omnivorous; both prepare nests of leaves,

straw, and hay for their young; the young of both are born blind and naked; both are exceedingly prolific. The Black Rat is grayish-black above and ash-color beneath; its length is seven to eight inches; the tail a trifle more. The Brown Rat is nine to eleven inches long; the tail about eight; it is grayish-brown above and grayish-white beneath.

"There are," says an exceedingly amusing English author,* "two kinds of rats known in Great Britain—the Black Rat and the Brown Rat. The Black Rat, or, as it is sometimes called, the *old English* rat, does not seem to be an aboriginal occupier of the British soil. The earliest mention of it is by Genner, in his *Historia Animalium*, published at Zurich about the year 1587. It is probable that it was introduced into this country from France, the Welsh name for it being to this day, as I have it from a gentleman of Welsh extraction, *Llygoden Ffrancon*—'the French mouse;' and I am, moreover, given to understand, on good authority, that it still abounds in the barns and granaries scattered throughout Normandy. We all know the common Brown Rat when we see it; the Black Rat is a different looking animal; he is much slighter in make, his upper jaw projects further over the lower jaw than it does in the Brown Rat; his ears are much larger, and his tail very much longer than in his first cousin, and lastly his color is a jet black, with numerous long hairs projecting out from the lower fur-like coat. He is a very timid creature, and rarely shows fight; he is, in fact, not very powerful, but his want of strength is made up by his excessive activity. I have examined several, and found their bodies a mass of muscle without a particle of fat."

It is a fact that may as well be frankly admitted, that, in the whole code of animal legislation, there is no such thing recognized as any sort of kindness to the "disabled and the aged," but quite the contrary. Dogs always worry the dog that is down; the herd forcibly eject the stricken or the hunted deer; and, among animals of every kind, the weak are always driven to the wall. This is not only what actually is, but, if the expression may be allowed, it is what should be. There is no place in the economy of nature for an old and useless animal, any more than there is for a withered leaf, farther than the gathering of it to the common store of materials. This does not apply to human beings, because there is a part in them which does not share in the "disabled and aged" state of the body, though its connection with material nature is of course weakened by bodily decay; and, for the sake of this, the existence of which is demonstrated by Christianity only, "Christian men" are bound to cherish the aged to the very last. With animals it is quite the reverse; their affection, if instinct ought under any circumstances to get such a name, is all for the young and the vigorous; and their attacks are directed against the feeble and the exhausted. If there is any hospitality in them it is Homer's hospitality—"Welcome the coming, speed the going;" and many of them—and the rats and mice among the rest—even in the most small and delicate of their species, have no objection to Malthusianize, by applying the "positive check," and eating the superabundant population of their own nests.

That rat eats rat is indeed as well established as any other fact in natural history; it is especially true that the Norway Rat has waged such war on his cousin the Black Rat, which was his predecessor in Europe and America, that the latter has become scarce where it once abounded, and in some places is absolutely extinct. Several illustrations of this process of destruction on the part of the Norway Rat are furnished by the writer just quoted, among which is the following:

"Some years ago a London rat-catcher shut up together in a cage the result of his day's work, consisting of several dozen rats, of both species, and put them away carefully for the night, their intended fate being to afford sport to his employer's dogs the next morning. What was his astonishment, when he came to fetch them, to find none but brown rats remaining! these cannibals having cruelly devoured all their sable brethren."

In proof of the general cannibal propensities of rats we have the following: "I once had three rats brought to me in a cage; in removing one it got hurt. I fed them, and put them into a stable. The next morning there were only two rats in the cage, the injured rat having been set

* F. T. Buckland, son of the celebrated geologist, Dr. Buckland, who has recently published a very clever little work entitled "Curiosities of Natural History." It consists of free jottings down of his own observations and experience in respect to various animals, and furnishes a large amount of curious knowledge, related in an easy, and at the same time spicy manner.

upon and slain by his fellow-prisoners. They had not only slain him, but had actually begun to eat him, choosing the head to begin upon. Wishing to see the result, I left him, and in the course of the day, although well supplied with bread and milk, these cannibals had nearly devoured their friend. I have preserved the bones as proof of the fact. I afterward ascertained that it was one only of these rats that was murderously inclined, for he killed and ate every rat put in to him. In the course of about a month, this brute killed five rats that were put into his cage. He always began at the neck, just behind the ear. A gentleman at Clapham, to whom I gave some rats, had bred a number in a squirrel's cage, which was hung up in a garden. One morning, not long ago, he looked at the rat in it—a white female with young. Instead of the white rat, he found a great brown male of the common kind coiled up in the nest. The white one was gone, and the young ones all killed and partly devoured. This brown rat must have climbed up a perpendicular smooth iron bar to get at the cage. Out of the hole in the cage, where the intruder got in, the white mother might have got out if she liked, but she preferred staying at home and looking after her young ones.

"I was witness to the following circumstance: a dog had been killing some rats for a match, and one wounded rat was left alive in the rat-pit. Twenty other rats were then placed in for another dog. These fresh comers found out the wounded one, and instantly, though there were many people looking on, set upon him and killed him then and there. One of the rats seemed to take the part of the wounded one, but a gigantic rat left the wounded one he was murdering and attacked the would-be rescuer and killed him also. This seems a wise provision, though, at first sight, a cruel one. If a wounded rat got into a hole, he would linger there perhaps many days in a dying state. His fellow-rats, however, soon find him out and put him out of his misery. At the same time it is a salutary check upon their increase, for a colony of rats has thus in itself the elements of self-destruction. Were all to live, there would not be sufficient food for their existence; some must die, and those are killed who are disabled from foraging for themselves. In this way, too, one poisoned rat often kills more; his neighbors eat his body, and with it the poison. But it appears that the rats have found out what poison is, for a gentleman with whom I was conversing on the subject informed me that he knew a case where poison having been placed down for rats, a pair of old ones drove their young away from it, and filled up the holes where it was placed, so that they should not get at it."

The following sketches will be found interesting: "There are two exhibitions of 'Happy Families' in London; one stands at Charing Cross and about the streets, the other remains permanently at Waterloo Bridge. They both claim to be the original 'happy family,' but I think the man at the bridge has the greatest claims to originality. He is the successor to the man who first started the idea, thirty-six years ago—Austin by name; the present owner has exhibited eight years, and always in the same place. Both of these men told me that black rats were very scarce things indeed; one of them had to give half a crown for a single one. He afterward got another, but finding they would not breed in captivity, he turned them out under the floor of his room, to give them a better chance of breeding; the result of the experiment he promised to let me know.

"I have been informed that a gentleman who was in the habit of crossing London Bridge early in the morning some years ago, frequently saw whole colonies of black rats out on the mud banks by the river side at low-water; lately, however, they have all disappeared, killed, most probably, by the increasing numbers of the Norway rats from the large granaries and store-houses that have sprung up near the bridge.

"An intelligent rat-catcher informs me that the present head-quarters of the old English black rat is the Isle of Dogs—in the Thames, below London—that they abound there in the numerous ditches, and come out to feed upon what is left by the tide. In his opinion these black rats are not aboriginal in England, but came over originally from Jersey in ships. They thrive, he tells me, in marshy places, particularly where the water is brackish, and there are many such places in Jersey. I have not yet had an opportunity of verifying his assertion. My friend Mr. Coulson, of Clifton, Bristol, most kindly sent me up five beautiful young black rats from Bristol; they were in a large iron cage, and when excited moved about the cage more like birds than rats. I never yet saw other creatures with four legs so active as they; their tails are remarkably long,

and they use them as levers to spring by when about to jump. Opening the cage to examine them, one escaped, running under my hand. It took myself, three other persons, and two dogs, three-quarters of an hour hunting in my room to catch him again—so active was the little brute. We were obliged finally to kill him to get him at all; one of my friends present very appropriately called him 'black lightning.'

"The other species of rat, now so universally known and generally esteemed a pest by all, is commonly supposed to have come from Norway, and is therefore called the Norway rat. This is a strange mistake, for it would imply that this animal was aboriginal in that country; whereas, in fact, at the time when the name was first applied to it, it was not even known to exist there. How this mistake arose I know not, except from the fact that there exists in Norway a little animal, not unlike a rat, called a lemming, described in a treatise entirely devoted to it by the celebrated Danish historian and antiquary, Wormius, about the seventeenth century. This may be the origin of the name; but, however, it made its appearance in Paris about the middle of the eighteenth century, and in England not many years earlier. It is now agreed by most naturalists that it is a native of India and Persia; that it spread onward into European Russia, and was thence transferred by merchant-ships to England and elsewhere.

"The rat is a most strict observer of the law 'Be fruitful and multiply;' for Madame la Ratte is generally in an interesting condition thrice a year, and on these occasions she does not look forward to nursing one helpless little individual, but thirteen or fifteen small unfortunates. I have had practical demonstration of the aptness of this family for propagating its species. In cleaning out the cage containing a little happy family of five rats, of variegated colors—all of which were perfectly tame, and lived in peace and harmony—I felt something among the hay, warm and soft; on taking it carefully out, it proved to be a little tiny rat, hairless and eyeless, but nevertheless endowed, like a biped baby, with the full and audible use of its infant lungs. On hearing its cries, the mother—a beautiful snow-white rat, upon whose head maternal cares were pressing at the early age of eight weeks—rushed forward, and seizing her screaming infant between her teeth, hastily ran off with it. Upon further examination, ten other young innocents were found carefully packed up in the corner of a cigar-box, which had been placed in the cage for the use of the colony in general, but which had been kindly vacated by the other considerate rats in favor of the lady who was literally in the straw. The owner is happy to announce that the mother and her little family are all doing well. Such, indeed, is the amazing fecundity of this animal, that they would soon overrun the whole country, and render all our attempts to destroy them fruitless, had they no enemies to lessen their numbers. But this baneful increase is happily counteracted, not only by numerous foes among other animals, but by their destroying and eating each other. The same insatiable appetite that impels them to indiscriminate carnage, also incites the strongest to devour the weakest, even of their own kind; and a large male rat is as much dreaded by its own species as the most formidable enemy.

"During summer the rat resides chiefly in holes on the banks of rivers, ponds and ditches; but on the approach of winter they visit the farm-houses, and enter the corn-ricks and barns, where they devour much of the corn, and damage more than they consume. They are very fond of pig-sties, running about among the pigs, picking up the leavings of the oatmeal out of the troughs, and even nestling down near to the warm body of the fat unwieldy porkers, whose obese sides make not bad pillows for his impudence—the rat.

"On one occasion, when a boy, I recollect secretly borrowing an old-fashioned flint-gun from the bird-keeper of the farm to which I had been invited. I ensconced myself behind the door of the pig-sty, determined to make a victim of one of the many rats that were accustomed to disport themselves among the straw that formed the bed of the farmer's pet bacon-pigs. In a few minutes out came an old patriarchal-looking rat, who, having taken a careful survey, quietly began to feed. After a long aim, bang went the gun—I fell backward, knocked down by the recoil of the rusty old piece of artillery. I did not remain prone long, for I was soon roused by the most unearthly squeaks, and a dreadful noise as of an infuriated animal madly rushing round and round the sty. Ye gods! what had I done? I had not surely, like the tailor in the old song of the 'Carrion Crow,'

'Shot and missed my mark,
And shot the old sow right bang through the heart.'

But I had nearly performed a similar sportsman-like feat. There was poor piggy, the blood flowing in streamlets from several small punctures in that part of his body destined, at no very distant period, to become ham, in vain attempting, by dismal cries and by energetic waggings of his curly tail, to appease the pain of the charge of small shot which had so unceremoniously awaked him from his porcine dreams of oatmeal and boiled potatoes. But where was the rat? He had disappeared unhurt; the buttocks of the unfortunate pig, the rightful owner of the premises, had received the charge of shot intended to destroy the daring intruder.

"To appease piggy's wrath, I gave him a bucketful of food from the hog-tub; and, while he was thus consoling his inward self, wiped off the blood from the wounded parts, and said nothing about it to any; no doubt, before this time, some frugal housewife has been puzzled and astonished at the unwonted appearance of a charge of small shot in the center of the breakfast ham, which she procured from Squire Morland, of Sheepstead, Berks.

"The frequenters of the Zoological Gardens in Regent's Park, may, if the room be quite quiet, and the sun warm, observe numerous rats in the den of the rhinoceros. I have frequently watched them playing about, and running backward and forward over his thick armor-like hide, as he lies basking in the pleasant sunshine. He evidently thinks them quite beneath his notice, for he makes no efforts to drive them away, beyond occasionally flapping his great ear when they tickle him in any tender part. They come to the rhinoceros's house for the same purpose that they go to the pig-sty, viz., to get what they can from the leavings of their superiors. The keeper informs me that he not unfrequently finds dead rats crushed quite flat in the straw under the place where the rhinoceros has been sleeping. The poor rat has but a small chance of escape when the huge carcass of the great beast comes plump down upon him, and settles itself there for a good long sleep. Rats, too, are also found killed in the same manner in the straw bed of the elephant. These rats probably come out of the straw thatch which covers the building where the rhinoceros and elephant live; they are common also in the deer-house, where they come for the oats, of which they are particularly fond.

"If any person wishes to keep rats alive a long time in a cage, let him give them plenty of oats and plenty of water, for the absence of water will kill them in a very few hours. A fine full-grown rat was brought to me; it appeared in perfect health and vigor, and when I went near it, it ran about the cage uttering its peculiar cry of alarm, and fixing itself in an attitude of defense up in one corner of the cage. I introduced a spoonful of water to it, and in a moment it seemed to forget its ferocity, for it came up hesitatingly at first, and tasted the water; gaining courage, it soon took hold of the spoon with its fore-paws to steady it, and greedily drank up all the water. I gave it two or three spoonfuls more, and then some wet bread; the next day it had again some wet bread, but not any water. On looking at it the next morning I found my poor rat in the agonies of death. I took it out of its cage and poured some brandy down its throat, at the same time putting its hind-feet in hot water, but in vain; it died in my hand. I could find no internal cause for its death; but on consulting a rat-catcher he informed me that it died for want of water without a doubt. I must therefore confess that I unwittingly was the cause of its dying, and for the future I shall know better how to act toward captive rats. One great reason why they are so abundant at the Zoological Gardens is, that they have free access to water from the banks of the Regent's canal, as well as plenty of food, which they purloin from the animals. In the deserts of Africa there are numerous colonies of rats and mice of different kinds; now how do these little beasts live during the droughts without water? The all-wise and ever kind Creator has provided for their wants. An African traveler, Campbell, writes—'I was surprised how so many mice could have lived without water, till I observed them rolling berries from succulent plants into their holes. On examining one of the largest of these berries I found it contained about three teaspoonfuls of water. This is a provision God has made to supply the wants of these little animals.' Man, too—the poor Bushman—is supplied with water from a similar source, for he finds growing in arid and dry places natural water reservoirs in the shape of 'melons, which being roasted yield good water.'

"Rats, when hard pressed for food, are not particular as to what they eat. In extremities they will attack and devour human flesh. An instance, corroborating this fact, came to my personal knowledge and inspection about Christmas-time, 1851. The body of an unfortunate pauper, whose frame was emaciated to the last degree by famine and want, was brought to one of the theaters of anatomy in London, for dissection. When the corpse was placed on the table, it was found that the whole of the lips and parts of the ears were wanting; in the place of the eyeballs were empty sockets; the parts also covering the palmar surface of the fingers were gone, only the bones and nails being left. Besides this, marks of teeth were visible on various other parts of the body. How came all this mutilation? What had caused this fearful disfigurement? Upon inquiry, it was ascertained that this poor victim of starvation had been taken in from the streets, friendless and unknown, into a workhouse—there he had died, and had been carried to the dead-house previous to removal to a dissecting-room. The rats—for, living in a workhouse, we may suppose that they, too, did not get too much to eat—had found out the corpse, and in the space of one night had committed all this havoc, devouring the most tender parts of the body; at least, I suppose they had found the parts that were missing were the most dainty morsels, for the marks of their sharp teeth showed that they had had a taste of nearly every other part of the body. After this event, means were taken to prevent the ingress of the rats into the dead-house, and a similar case has not since occurred.



HAWK AND RAT.

"Rats will sometimes attack living men, though in this case fear, and not hunger, is their motive. Mr. Mayhew writes as follows:—'About that time a troop of rats flew at the feet of another of my informants—one of the men who work in the London sewers—and would have no doubt maimed him seriously, "but my boots," said he, "stopped the devils." "The sewers generally swarm with rats," said another man: "I runs away from 'em, I don't like 'em. They in general gets away from us; but in case we comes to a stunt end where there is a wall and no place for 'em to get away, and we goes to touch 'em, they fly at us. They're some of 'em as big as good sized kittens. One of our men caught hold of one the other day by the tail, and he found it trying to release itself, and the tail slipping through his fingers; so he put up his left hand to stop it, and the rat caught hold of his finger, and the man's got an arm now as big as his thigh."'"

After so many things said against rats, it is a relief to find something in their favor. "The rat," says our entertaining author, "is one of the most tormented of created animals; he has many enemies and very few friends; wherever he appears his life is in danger from men, dogs, cats, owls, hawks, &c., who will have no mercy on him. These perpetual persecutions oblige him to be wary in his movements, and call for a large amount of cunning and sagacity on his part, which give his little sharp face a peculiarly knowing and wide-awake appearance, which the most superficial observer must have noticed. Though, poor creature, he is hated and killed by man, his sworn foe, yet he is to that same ungrateful race a most useful servant, in the humble capacity of scavenger; for wherever man settles his habitation, even in the most remote parts of the earth, there, as if by magic, appear our friends the rats. There were thousands of rats in the camp before Sevastopol, and a rat-hunt in the trenches was not an uncommon occurrence. Again, they swarm at the camp at Aldershot; the sentries see them at night going to the nearest water to drink. The rat quietly takes possession of the out-houses, drains, &c., and occupies himself by devouring the refuse and filth thrown away from the dwelling of his master—under whose floor, as well as roof, he lives. This refuse, if left to decay, would engender fever, malaria, and all kinds of horrors, to the destruction of the children of the family, were it not for the unremitting exertions of the rats to get rid of it, in a way no doubt agreeable to themselves, namely, eating it. Let us take an example. The sewers adjoining a connected series of slaughter-houses, as Newgate-market, Whitechapel, Clare-market, &c., are often nearly choked up with offal and the foul refuse of animal matter, swept into them by the careless butchers. It may be imagined what fearful maladies would arise from this putrid mass if it were allowed to stay there neglected. How is this evil result prevented? Why, by the poor persecuted rats, who live there in swarms, and devour every morsel of concentrated cholera as it comes down to them, profiting thereby themselves and the inhabitants of the houses who reside above their haunts."

The following facts are exceedingly curious: "When in Paris, I paid a visit to the horse-slaughtering place at Montfaucon; there I saw from fifteen to twenty horses, tied up in a row, all to be killed that day. I was told that sometimes they slay double that number. The horse being killed, and the skin taken off, the carcass is cut up with hatchets, and thrown into a huge metal tub, big enough to contain the bodies of several horses; when it is full, the top is fixed on, and steam turned into it. After a time the lid is again taken off, and it is found that the steam has quite separated all the flesh from the bones, which are beautifully white. The bones are then picked out and placed in stacks; the flesh is thrown out by shovels, and spread out widely on floors, to which the air has free access. It soon becomes quite hard and dry, and is then sent off in sacks to the chemist, who, operating on it, soon converts it into prussiate of potash, and this again into Prussian blue. The bones are ground up in a mill for manure; so that, in a comparatively short space of time, the horse, having worn out his energies in the service of man, and being of no further use, is converted, one half into Prussian blue, the other into loaves of bread, through the medium of the wheat which absorbs his powdered skeleton. Thus the Frenchman practically carries out the threat of the ogre, who, when he smelt the Englishman, pronounced the following anathema against him—

> Fe fa fum;
> I smell the blood of an Englishman;
> Be he alive or be he dead,
> *I'll grind his bones to make my bread.*'

"In the place where these bones are stacked were plenty of rats. It is walled round, and in the inside of the wall are several holes left. When the bones are taken out, the rats, finding themselves becoming exposed, endeavor to conceal themselves in the holes. These holes are only just deep enough to contain half their bodies, and their tails are left exposed, capital handles for the men to catch them by. They are placed, when caught, in cages, and carried off. But what becomes of them? We have heard that their skins are used to make gloves. I have inquired in many glove-shops in London for gloves of this description, and friends in Paris have also made the same inquiries, but without success. Either they are not used for this purpose, or, what is more probable, the glove-dealers won't own to rat-skins in their gloves.

"An ingenious individual of Liskeard, Cornwall, has for some time past been exhibiting himself in a dress composed from top to toe of rat-skins, which he has been collecting for three years and a half. The dress was made entirely by himself; it consists of hat, neckerchief, coat, waistcoat, trousers, tippet, gaiters and shoes. The number of rats required to complete the suit was six hundred and seventy, and the individual, when thus dressed, appears exactly like one of the Esquimaux described in the travels of Parry and Ross. The tippet, or boa, is composed of the pieces of skin immediately round the tails of the rats, and is a very curious part of the dress, containing about six hundred tails—and those none of the shortest."

"The tail is indeed a most useful appendage to the rat: it is composed of a chain of small bones, with a multitude of muscles to move them. Many minute scales and short hairs cover it, and thus constructed it becomes prehensile, as the tails of many monkeys and lemurs; in fact, a sort of hand to the rat, by means of which he is enabled to crawl along the tops of railings, and along narrow ledges of walls, balancing himself by it, or entwining it round the projecting portions of the difficult passages along which his course lies. By means of it, too, he is enabled to spring up heights otherwise inaccessible, using it on these occasions—like the kangaroo—as a lever, or rather as a projectile spring. When, moreover, according to a story which requires confirmation, the delicious oil or sweet wine lies beneath his reach in the long-necked bottle, his ever-useful tail serves him in good turn; he dips it into the coveted fluid, and then enjoys the reward of his sagacity, and says to himself, as he licks it up, 'What's a rat without a tail?'"

It has been said that the rat, in imitation of some other animals, uses his tail to catch fish, a statement, to say the least, very apocryphal. Nevertheless, fiction or fact, it has been turned to moral account in the following fable:

"A rat with greedy appetite,
Went fishing with his tail one night;
He once had seen a fox do that—
'And if a fox, why not a rat?
For surely he is quite as knowing
As any other beast that's going.'
Cocking his eye in fond conceit,
That he knew fish as well as meat
He silent sat upon the shore,
And bobbed for half an hour or more.
At last, a hungry bite he felt,
And deemed it roach, or perch, or smelt.
Eager, but cautious, did he wait
To let his prey grasp well the bait;
Then, like a fisher skilled and nice,
He jerked; but lo! as in a vice
His tail stuck fast; and, strange as true,
The more he pulled the worse it grew!
This way and that in vain he turned;
In vain he jerked, and jumped, and squirmed—
In vain he yelled with pain and grief—
In vain cried murder, fire, and thief!
In vain; for lo! an oyster vast
Had caught his tail, and held it fast!

At length, the rat perceived the case,
And putting on a smiling face—
Staying meanwhile his tears and groans,
Though pain and terror thrilled his bones—
Addressed the oyster thus: 'My friend,
There's some mistake; my latter end
Was never made for feast or fete—
I only put it in for bait,
And as you've taken it, I opine
That you are caught, and so are mine:
I pray you, therefore, oyster tender.
Just come ashore, and thus surrender.'

The oyster answered not a wink,
But in the wave began to sink;

Down, down by slow degrees he went
To the wild rocks in sheer descent,
Dragging the rat, 'mid cries of slaughter,
'Beneath the dark and stormy water.'
He sank, and o'er him danced the bubbles
In mockery of all his troubles;
Nothing was left but this, his story,
And the plain truth it sets before you—

The cunning rat, who apes the fox,
And risks his tail among the rocks;
Heedless of dangers dark and awful,
In search of pleasures all unlawful—
Is by a stupid oyster caught,
And made the prey of him he sought:
Ye cunning human rats beware,
Unlawful pleasures should you dare
To seek along the shores of sin,
Lest some huge oyster pull you in!"

Although our history of rats is getting long, we cannot deny ourselves or our readers the pleasure of a few more extracts: "Rats have a remarkable instinct for finding out where there is any thing good for food; and it has been often a subject of wonder how they manage to get on board ships laden with sugar and other attractive cargoes. This mystery has, however, been cleared up, for they have been seen to come off shore to the ship by means of the rope by which she is moored to the quay, although at some distance from the shore. By the same means they will leave the ship when she comes into port, if they find their quarters filling or filled with water; hence, the saying that 'rats always leave a sinking ship' is perfectly true. If, however, the ship be water-tight, they will continue breeding to an enormous extent. M. de St. Pierre informs us, that on the return of the Valiant, man-of-war from the Havannah, in the year 1766, its rats had increased to such a degree that they destroyed a hundred weight of biscuit daily. The ship was at length smoked between decks, in order to suffocate them, and six hampers were for some time filled every day with the rats that had thus been killed.

"Rats are not altogether selfish animals: having found out where the feast is stored, they will kindly communicate the intelligence to their friends and neighbors. The following anecdote will confirm this fact. A certain worthy old lady, named Mrs. Oke, who resided at Axminster several years ago, made a cask of sweet wine, for which she was celebrated, and carefully placed it on a shelf in the cellar. The second night after this event she was frightened almost to death by a strange unaccountable noise in the said cellar. The household was called up, and a search made, but nothing was found to clear up the mystery. The next night, as soon as the lights were extinguished and the house quiet, this dreadful noise was heard again. This time it was most alarming; a sound of squeaking, crying, knocking, pattering feet; then a dull scratching sound, with many other such ghostly noises, which continued throughout the live-long night. The old lady lay in bed with the candle alight, pale and sleepless with fright, anon muttering her prayers, anon determined to fire off the rusty old blunderbuss that hung over the chimney-piece. At last the morning broke, and the cock began to crow. 'Now,' thought she, 'the ghosts must disappear.' To her infinite relief the noise really did cease, and the poor frightened dame adjusted her nightcap and fell asleep. Great preparations had she made for the next night; farm servants armed with pitchforks slept in the house; the maids took the family dinner-bell and the tinder-box into their room; the big dog was tied to the hall-table. Then the dame retired to her room, not to sleep, but to sit up in the arm-chair by the fire, keeping a drowsy guard over the neighbor's loaded horse-pistols, of which she was almost as much afraid as she was of the ghost in the cellar. Sure enough her warlike preparations had succeeded; the ghost was certainly frightened; not a noise, not a sound, except the heavy snoring of the bumpkins, and the rattling of the dog's chain in the hall could be heard. She had gained a complete victory; the ghost was never heard again on the premises; and the whole affair was soon forgotten. Some weeks afterward some friends dropped in to take a cup of tea, and talk over the last piece of gossip. Among other things the wine was mentioned, and the maid sent to get some from the cel-

lar. She soon returned, and gasping for breath, rushed into the room exclaiming—'Tis all gone, ma'am;' and sure enough it was all gone. 'The ghost has taken it!' Not a drop was left, only the empty cask remained, the side was half eaten away, and marks of sharp teeth were visible round the rugged margins of the newly made bung-hole.

"This discovery fully accounted for the noise the ghost had made, which caused so much alarm, The aboriginal rats in the dame's cellar had found out the wine, and communicated the joyful news to all the other rats in the parish; they had assembled there to enjoy the fun, and get very tipsy—which, judging from the noise they made, they certainly did—on this treasured cask of wine. Being quite a family party they had finished it in two nights, and having got all they could, like wise rats they returned to their respective homes, perfectly unconscious that their merry-making had nearly been the death of the rightful owner and 'founder of the feast.' They had first gnawed out the cork, and got as much out as they could; they soon found that the more they drank the lower the wine became. Perseverance is the motto of the rat, so they set to work and ate away the wood to the level of the wine again. This they continued till they had emptied the cask; they must then have got into it and licked up the last drains, for another and less agreeable smell was substituted for that of wine. I may add, that this cask, with the side gone and the marks of the rats' teeth, is still in my possession."

As evidence that rats may be tamed, we have the following: "A gentleman traveling through Mecklenburg about forty years ago, was witness to a very singular circumstance in the post-house at New Hargard. After dinner, the landlord placed on the floor a large dish of soup, and gave a loud whistle. Immediately there came into the room a mastiff, a fine Angora cat, an old raven, and a remarkably large rat, with a bell about its neck. They all four went to the dish, and without disturbing each other, fed together, after which the dog, cat, and rat lay before the fire, while the raven hopped about the room. The landlord, after accounting for the familiarity which existed among these animals, informed his guest that the rat was the most useful of the four, for the noise he made had completely freed the house from the other rats and mice with which it had previously been infested.

"When carrying on my observations on rats, I bought a pair of piebalds, and put them in a Ward's case, which formed a capital cage for them. In the course of a few weeks my colony increased to an enormous extent: I had specimens of almost every kind of rat—the pure white albino rat with pink eyes, the common brown rat, the true black rat, and the snake or ship-rat. I had to pay several shillings for my black rat, but he was a fine beast. By taking trouble I obtained some very remarkable crosses: I had one litter half albino half black—the white the color of snow, the black the color of coal. Their physiognomy, too, was very peculiar, and a rat from this lot might readily have been taken for a new species; they were really very pretty creatures. I could never obtain a cross between a black and a brown rat, except through the medium of a hybrid in whom the blood of the black breed existed. Of the cross between the brown and white rat I had many live specimens, so many, indeed, that periodically I took a bagful to the Zoological Gardens, for the benefit of the snakes. All my rats knew me well. The moment I came to the room they swarmed round the door of the cage, and I was obliged to keep them back while I put in their food, as a huntsman does his hounds. At feeding-time there was not a single rat in the cage that I could not take up and handle with impunity; they never offered to bite me. If, however, a stranger tried to touch them, they were all up on their hind-legs in a fighting attitude in a moment.

"Talking of tame rats, I knew a worthy whipmaker who worked hard at his trade to support a large family. He had prepared a number of strips of leather, by well oiling and greasing them. He carefully laid them by in a box, but strange to say, they disappeared one by one; nobody knew any thing about them, nobody had touched them.

"However, one day as he was sitting at work in his shop, a large black rat, of the original British species, slyly poked his head up out of a hole in the corner of the room, and deliberately took a survey of the whole place. Seeing all quiet, out he came, and ran straight to the box wherein were kept the favorite leather strips. In he dived, and quickly reappeared, carrying in his mouth the most dainty morsel he could find. Off he ran to his hole, and quickly vanished.

Having thus found out the thief, the saddler determined to catch him. He accordingly propped up a sieve with a stick, and put a bait underneath; in a few minutes out came the rat again, smelling the inviting toasted cheese, and forthwith attacked it. The moment he began nibbling at the bait, down came the sieve, and he became a prisoner. 'Now,' thought he, 'my life depends upon my behavior when this horrid sieve is lifted up by that two-legged wretch with the apron on, who so kindly cuts the greasy thongs for me every day; he has a good-natured looking face, and I don't think he wants to kill me. I know what I will do.'

"The whipmaker at length lifted up the sieve, being armed with a stick ready to kill Mr. Rat when he rushed out. What was his astonishment to see that the rat remained perfectly quiet, and, after a few moments, walk quietly up on his arm, and look up in his face, as much as to say, 'I am a poor innocent rat, and if your wife *will* lock up all the good things in the cupboard, why I must eat your nicely-prepared thongs; rats must live as well as whipmakers.' The man then said, 'Tom, I was going to kill you, but now I won't; let us be friends. I'll put you some bread and butter every day if you will not take my thongs and wax, and leave the shopman's breakfast alone; and—but I am afraid you will come out once too often; there are lots of dogs and cats about who won't be so kind to you as I am; you may go now.'

"He then put him down, and Mr. Rat leisurely retreated to his hole. For a long time afterward he found his breakfast regularly placed for him at the mouth of his hole, in return for which he, as in duty bound, became quite tame, running about the shop, and inquisitively turning over every thing on the bench at which his protector was at work. He would even accompany him into the stables when he went to feed the pony, and pick up the corn as it fell from the manger, keeping, however, a respectable distance from the pony's legs. His chief delight was to bask in the warm window-sill, stretching his full length to the midday sun. This unfortunate though luxurious habit proved his destruction, for one very hot day, as he lay at his ease taking his siesta, the dog belonging to the bird-shop opposite espied him afar off, and instantly dashed at him through the window. The poor rat, who was asleep at the time, awoke, alas! too late to save his life. The cruel dog caught him, and took him into the road, where a few sharp squeezes and shakings soon finished him. The fatal deed being done, the murderous dog left his bleeding victim in the dusty road, and with ears and tail erect, walked away as though proud of his performance. The dog's master, knowing the history of the rat, had him stuffed, and his impaled skin, with a silver chain round the neck, forms to this day a handsome addition to the shop-front of the bird-shop in Brompton."

A report was published some months ago, in the *Gazette des Tribunaux*, of Paris, of a trial which had taken place there between a gentleman and a Zouave who had served in Africa, the latter having sold the former a new species of animal which he called the *Trumpet Rat:* that is, a rat with a trunk or proboscis, nearly an inch long, upon his nose. The suit was for damages, on the ground that the plaintiff was imposed upon, inasmuch as this specimen was produced by artificial means. The case, as given by the author we have so liberally quoted, was as follows:

"The *Plaintiff*—'Gentlemen, this individual has cheated me out of a hundred francs, and has, at the same time, willfully abused my confidence. He knows that I am much interested in geology, antiquities, natural sciences. I have collections of fossils, of medals, of shells, of rare animals, of curious plants. One day he called upon me and said, "Sir, I have a kind of animal which has never been mentioned by any naturalist." "What is it, sir?" "It is 'the *Trumpet Rat.*'" "What do you call the trumpet-rat?" "Sir, as the name indicates, it is a rat which has a trumpet." "Where is it?" "On his nose, like a rhinoceros." "And you have it alive?" "Alive and well; if you wish to see it, you have only to come to my house." "Directly; come along."

"'I was very anxious to see this strange animal. We arrive at his house, and he shows me in a cage an enormous rat, very lively and in good condition, and which really had on its nose a sort of slender excrescence about two centimetres long—two-thirds of an inch—covered with hair like the body of the animal, with vertebræ in it, and, a most extraordinary thing, larger at the summit than at the base, the contrary to what it ought to be in the usual course of things. I ask to examine this phenomenon; he puts it in my hand, and holds its paws and head that I might examine at my ease this extraordinary trumpet. I ask him if it was not a cheat, and a

mystification, and to convince myself I take a pin and force it into the trumpet. The animal cried out, winced, and a drop of blood came from the prick. The experiment was conclusive—it was really a trumpet forming a part of the rat.

"'I wonder. I ask this man if he would sell his rat. He answers in the affirmative. I ask his price. Fifty francs. I pay it without any bargaining, and I bring the animal home. I invite my friends and servants to see it; the cry of admiration was universal—I was enchanted.

"'Some one says to me, "You ought to procure a female,"—this was a male. I had thought of that, but having seen but one rat at the house of the person who sold it to me, I concluded that he had no more. I determined, therefore, to go directly to see, and I ask him if it were possible to get a female. "Nothing easier," he answered me; "I have written to Africa, and they have sent me many trumpet-rats, of which I have two females." With these words, he brings out a cage full of rats like that which he had sold me. He chooses me a female, for which I pay him fifty francs. I carry it off more enchanted than ever. Some months afterward the female has young; I look at them, they had not trumpets! I say to myself, "Without doubt they will sprout hereafter like the elephant's tusks." I wait one month, two months, six months; every day I look at the nose of my rats, but the trumpet never appeared.

"'In a house where I go frequently I make the acquaintance of an officer who had served a long time in Africa. "Tell me," I says to him one day—"you have been in Africa—do you know the trumpet-rats?" "Perfectly," he answers me. "Ah! then you can inform me." I then tell him my story. Then this gentleman began to laugh as though his sides would split. I say to myself, "Certainly then I have been duped." When he was calm I beg him to explain the motive of his hilarity. Then he tells me what follows: the trumpet-rat, he tells me, is not a supernatural thing, it is an invention due to the leisure moments of the Zouaves. This is how they make them: you take two rats; you tie their paws firmly on a board, the nose of one close to the end of the tail of the other; with a pen-knife or a lancet you make an incision into the nose of the rat which is hindermost, and you graft the tail of the first into the nose; you tie firmly the muzzle to the tail, and you leave the two rats in this position for forty-eight hours. At the end of the time the union has taken place, and the two parts are grown together; then you cut off the tail of the rat which is in front to the required length, and let him go, but still keep the other tied to the board, but with his head loose, and you give him something to eat. At the end of a month or more the wound is perfectly healed, and the eyes of the most curious scrutators would not see a trace of the grafting. This is what these Zouaves do; the rats have no trumpet, you have been deceived—*les rats n'ont pas de trompe; vous avez été trompé.*'

"On the part of the defendant, it was urged that he had certainly made up the rats as has been stated, but he affirms that he had not sold them to the plaintiff as rats '*born*' with a trumpet.

"The *President*—'Is this true, M. Triguel?'

"*M. Triguel*—'You understand, sir, after the experiment which I made with the prick of the pin, which bled and made the animal cry, I ought to believe that the trumpet was natural.'

"The *President*—'Then the defendant told you that it was a particular kind of rat?'

"The *Plaintiff*—'Yes, without doubt.'

"The *Defendant*—'In fact, it is a particular kind of rat.'

"Verdict for the Zouave, the trumpet-rat maker."

We have no reason to doubt that such a case as this actually occurred, but that the rat in question was produced in the manner which the report seems to imply, that is, by tying one rat down and making another rat's tail grow on to his nose, we very much doubt. There is a kind of rat or mouse in Africa which nature has endowed with a trumpet or proboscis of its own, called the *Rat à trompe* by the French, an account of which we have given at page 142. We suspect that if the whole truth were known, it would appear that one of this species, and not an artificial rat, was the subject of the trial in question.

The number of rats collected in the sewers of the larger cities of Europe—which are indeed of such extent as to be like underground cities—is absolutely appalling. Here, for the most part secure in the possession of their hideous abodes, they feed and fatten on every species of offal, carrion, and filth. Every person who has read the "Mysteries of Paris" must recollect the scene

in which Rodolph, the hero of the story, is plunged into a cellar, where, amid the rising waters which threaten to drown him, he is beset by rats. This fanciful picture is but a representation of the possible truth. One of the centers of attraction to these brutes in the French capital, is the establishment at Montfaucon—already mentioned—for the killing of disabled horses. It was proposed some years ago to remove this to a greater distance from the city, but it was objected that the immense number of rats that had long congregated there would be dangerous to the inhabitants in the vicinity. A government examination was ordered, and the facts reported are startling. It appeared that the carcasses of the slaughtered horses, sometimes to the amount of thirty-five per diem, are found next morning picked to the bare bone by the rats. A part of this establishment is inclosed by solid walls, at the bottom of which several holes are made for the entrance and exit of these vermin. Into this place Dusuassois, the proprietor, put the dead bodies of two or three horses, and having stopped up all the holes toward midnight, with as little noise as possible, he, with several workmen, each bearing a torch in one hand and a stick in the other, suddenly entered the inclosure, shut the door, and began a general massacre. Wherever a blow was directed, even without aim, a rat was killed; and those which attempted to escape by running up the walls were quickly knocked down. The dead of one night amounted to 2,650; the result of four hunts was 9,101; and by repeating the experiment at intervals of a few days, Dusuassois destroyed 16,050 rats in the space of a month. Now when it is recollected that the yard in which these numbers were killed does not contain more than a twentieth of the area over which the dead horses are spread, some idea may be formed of the multitudes that infest this place; indeed, the adjoining fields and eminences are riddled with their burrows, and their paths thereto may be traced from the inclosures where the horses are slaughtered. It is probable that the rats of both Paris and London greatly exceed in number the human inhabitants.

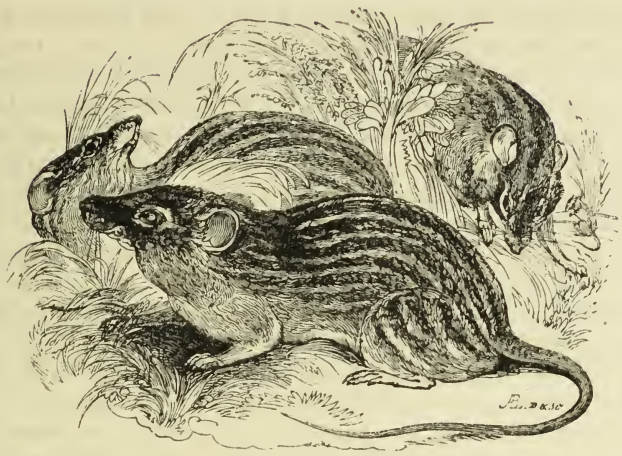
We have a few facts to add to this long account in respect to the Black and Brown Rat, both of which, long since domesticated in America, have become denizens of every part of the country. Of the size, appearance, and habits of the former, it may be said they are the same as in that of Europe. It is alike prolific and voracious; its winter abodes are barns and granaries, cellars and outhouses, pig-sties and stables. In the summer it usually quits these haunts, and lives in the woods and fields, but with the cold season it returns, making depredations not only in the pantry, the larder, and the potato-bin, but in the granary, and even among eggs, ducks and chickens, if such come in its way. It is less destructive in its nature than the Norway Rat, and has greatly diminished before the superior strength and voracity of that species, but in some localities it still exists in formidable numbers, and is a great pest.

The American Norway Rat is also the same as its European brother. The stories of the fierceness and voracity of the latter, some of which we have repeated, could be easily rivalled in respect to the former. It has been said that the toes and parts of the feet of bed-ridden persons have sometimes been eaten away by the Norway Rat of Europe; thus the old German rhyme says—

> "A Saxon duke had grown so fat,
> 'Tis said that many a mouse and rat
> Ate grots and labyrinths to dwell in
> His palsied parts, without his feeling."

In this country instances are recorded of the American species having attacked men while asleep, and persons are sometimes met with showing a piece of the ear or of the nose bitten out in their childhood by these vicious brutes. They are exceedingly pugnacious, and when several of them are together they are frequently seen fighting, biting, and squabbling among themselves. They are very abundant in New York and other large cities, especially along the wharves and docks, where they grow very large, and are called *Wharf-Rats*.

Among the African species of this genus is the Barbary Mouse, *M. Barbarus*, called *Pharazef*, or the *Palmetto Mouse*, by the natives. It is of a grayish-fawn color, with ten longitudinal brown stripes along the back. Gervais says it is in size between the field-mouse and the black rat. It is an exceedingly pretty animal, feeding on seeds and grain, and may be easily tamed, when it becomes familiar and pleasing. It produces six to eight young at a birth, and is common



THE BARBARY MOUSE.

in Northern Africa. The *M. pumilio* is of Southern Africa, the stripes of which are less numerous than those of the preceding.

The Rat of the Nile, *M. Niloticus*, is seven inches long, the tail four; the color, brown mixed with fawn, above; below, it is a grayish-yellow. It lives along the borders of rivers.

The Alexandria Rat, *M. Alexandrinus*, resembles the brown rat in size, color, and habits. It is a native of Egypt, and is said, within the last century, to have been introduced into Eastern Europe. Hence M. Selys includes it in the European species, under the title of *M. tectorum*.

Besides the common mouse and the black and brown rats, which are the same with us in size, color, and habits as in Europe, we have in America several species of this genus which deserve notice. The White-footed Mouse, *M. leucopus*, is an exceedingly pretty animal, two and a quarter inches long, with the tail a trifle longer. It is a yellowish-brown above, the feet and belly white. It is believed, next to the common mouse, to be the most widely distributed species in North America. It is found in every state in the Union, and north as far as Labrador. It is very nimble, builds its nests, with an entrance from below, sometimes on shrubs, sometimes on the low drooping branches of trees, and lives on seeds, grain, and grass, of which it lays up stores. It is nocturnal in its habits, and avoids houses, living in woods, thickets, and fields. It generally digs a burrow, but sometimes appropriates to its use the deserted nests of birds, and sometimes occupies the vacant burrows of the smaller quadrupeds.

The Asiatic species of this genus are numerous. Among them we might include the Black and Brown Rats, already described, they doubtless having originated in that quarter of the globe. Their migration from village to village, and from town to town, until they became recognized as the "old inhabitants" of Europe, was the work of centuries. There are still other species, some of which belong to the genera which we shall soon notice, and where they will be described.

We now turn to America. The American Harvest Mouse, *M. humilis*, is about two inches and three-quarters long, with a tail two inches; its color is reddish-gray above, yellowish-white beneath. In several respects it approaches the genus *Arvicola*. It is sparingly distributed from New York to South Carolina.

The Orange-colored Mouse, *M. aureolus*, arranged by some naturalists under the subgenus *Calomys*, of Waterhouse, is four and a quarter inches long; orange color above and buff beneath; found in Georgia and South Carolina.

The Missouri Mouse, *M. Missouriensis*, is four and a half inches long, light fawn above and white below; found in Missouri.

The Carolina Mouse, *M. Caroliniensis*, is two and a half inches long, of a light lead-color, and is found sparingly in the low grounds of some of the maritime districts of South Carolina.

Leconte's Mouse, *M. Lecontei*, is two and a half inches long, of a reddish-brown above and fawn below, and is found in Georgia.

The Michigan Mouse, *M. Michiganensis*, is, above, light grayish-brown; below, of a whitish color. Its length is four inches.

These and some other American species in California, and other frontier parts of the United States, are arranged by Baird under several generic heads.

The Wood Rat, or Cotton Rat, arranged by Say and Ord under the generic name of Sigmodon, and to which they give the specific title of *hispidum*—the *Arvicola hispidus* of Godman—is six inches long, with a tail four inches; above it is yellowish-brown; beneath, ash-color. It is very abundant in the Southern States, where it prefers hedges, ditches, and deserted fields to gardens and cultivated lands; it feeds on seeds, grass, and vegetables, but relishes flesh, and readily devours birds that fall wounded in the fields; it also eats crayfish which it gets from the ditches. It is very voracious, attacks and devours other species of mice and rats, also killing and eating its own species. It is exceedingly prolific, lives in burrows, and is nocturnal in its habits. This, like many other species of mice, forms the staple food of foxes, wild-cats, owls, hawks, and other flesh-eaters.



DENDROMYS TYPICUS.

We now turn to various species of rat-like animals, but of genera distinct from the preceding.

The *Genus* DENDROMYS: *Dendromys*, includes two African species, the *D. typicus* and *D. melanotis*, which are the size of common mice, and are of a pearly-gray color, and have a black band running along the back.

Genus ACOMYS: *Acomys*.—Of this there are several African species. The Cairo Mouse, *A. Cahirinus*, is mentioned by Aristotle, and is of the size of a common mouse; the fur is spiny, and of an ash-color on the back; below it is softer, and of a lighter shade. It is found in Syria. The *A. spinosissimus* is found in Mozambique.

Genus CRICETOMYS: *Cricetomys*.—There is only one well known species of this genus, the *C. Gambianus*. It is larger than the brown rat, and has cheek-pouches; it burrows in the earth, but climbs trees to obtain fruits, on which it feeds. It is found in Fernando Po and Kordofan. M. Rappel calls it the *Goliath Rat*. Species of Cricetomys are also found in Mozambique.

Genus SACCOSTOMYS: *Saccostomys*.—Of this there are two species, *S. lapidarius* and *S. fuscus;* they are distinguished by cheek-pouches.

Genus PELOMYS: *Pelomys*.—Of this there is one species, *P. fallax*, having the incisors furrowed like those of the Gerbils. The two preceding genera are of Mozambique.

Genus STEATOMYS: *Steatomys*.—Of this there are two species, the *S. edulis* and *S. Krebsii*, having incisors resembling those of the preceding, but with short tails. These are African. There



THE CAIRO MOUSE.

are a large number of Asiatic species, some of which are as small as the common mouse; others are of much larger size. The Caraco Rat, *M. caraco*, found in China, Mongolia, and Siberia, is a quarter larger than the brown rat, and lives, like that species, in the houses.

The Giant Rat, *M. giganteus*, is twenty-seven inches long, with a tail thirteen inches. It appears like a Brown Rat dilated to enormous proportions; its weight is three pounds. It is found in many places on the coast of Coromandel, in Mysore, and in several parts of Bengal between Calcutta and Hurdwar, and is called *Bandicoot* by the natives, though this name has been appropriated by the English to a marsupial animal that resembles it. It is partial to dry situations, and is hardly ever found distant from habitations. The lowest caste of Hindoos eat the flesh of this rat in preference to that of any other species. It is a most mischievous animal, burrows to a great depth, and will pass under the foundations of granaries and storehouses if not deeply laid. Mud or unburnt brick walls prove no security against its attacks, and it commonly perforates such buildings in all directions. It is destructive in gardens, and roots up the seeds of all leguminous plants sown within its haunts. Cucurbitaceous plants and fruits also suffer by its depredations. When grain and vegetables are not within its reach, or are scarce, it will attack poultry; but the former are its choicest food. Dr. Gray remarks that the geographical range of this animal must be very extensive, as a species has been transmitted to the British Museum from Van Diemen's Land.

The Perchal Rat, *M. Perchal*, resembles the preceding in size and habits, and is found at Pondichery. It is distinguished by rigid hairs along the back.

The Tikus-Wirok, *M. setiger* of Horsfield, has been considered as the young of this species, but Dr. Gray shows this to be an error. It is found in Java, on the confines of woods and forests, and rarely approaches the villages and dwellings of the natives, who describe it, however, as a bold and mischievous animal. It is remarkable for the robustness of its form, and the size and strength of its front teeth; its nose is evidently employed in burrowing the ground in search of its food, and its tail has the character of those species which are in the habit of frequenting the water.



HAPALOTIS ALBIPES.

Genus NEOTOMA : *Neotoma.*—This includes the FLORIDA RAT, *N. Floridana :* it is of a lead color above and white below. It is eight inches long, partially nocturnal in its habits, is harmless and inoffensive, and lives in burrows, feeding on fruits and vegetables. It is found in the Southern and Southwestern States.



THE WHITE-BELLIED HYDROMYS.

There are several other species of Neotoma, as the BUSH RAT, *N. Mexicana*, found in Lower California; the *Neotoma Kescipes*, size of the Norway Rat, found in California; and the ROCKY MOUNTAIN RAT, *N. cinerea*, found on the Pacific coast.

Drummond's Neotome, *N. Drummondii*, is nine inches long, yellowish-brown in winter and ash-color in summer, and is found in the Rocky Mountains from 30° to 70° north latitude. Gray makes of this a genus which he calls TEONOMA, which is only an anagram of *Neotoma*.

The *Genus* OXYMYCTERUS: *Oxymycterus*, contains several South American species, among which are the *O. nasutus*, of the La Plata country, and *O. scalops*, of Chili.

The *Genus* AKODON comprises the *A. Boliviense*, of Bolivia and Peru.

The *Genera* REITHRODON, PHYLLOTIS, and ELIGMODONTIA embrace various South American species, but of no interest or importance. The *Genus* HOLOCHILUS includes the Brazilian Rat, the *Mus Brasiliensis* of Geoffroy, which is of the size of the Brown Rat. The Yellow Rat, *Mus lutescens*, resembles the preceding. The Pilori Rat, *Mus pilorides*, is still larger, and is in many respects peculiar. It is black above and white below, and is found not only in Brazil but in the West Indies.

We now come to the New Holland *Muriens*. The *Genus* HAPALOTIS presents several species. The *H. albipes* is nearly of the size of a rabbit, but of a mouse-like form, and is chiefly found in New South Wales. The *H. Gouldii* and *H. melanura* are of New Holland.

Genus HYDROMYS: *Hydromys*.—Of this there are two species, the Yellow-bellied Hydromys, *H. chrysogaster*, and the White-bellied Hydromys, *H. leucogaster*. Both are of a chestnut color above, but one is yellow and the other white, beneath. They are found along the Swan River.



MUS ALBOCINEREUS.

Beside the animals forming the two preceding genera, Australia has been found to possess a number of veritable species of the *Mus* genus. The distinguished naturalists Gray and Gould have given us descriptions of several, among which we may mention the *Mus albocinereus*, *Mus Australis*, and *Mus Grayii*. These are all of small size.

Genus PITHECHEIRUS: *Pithecheirus*.—This includes one animal, the *P. melanurus*, which has puzzled the naturalists, inasmuch as it resembles alike the rats and the opossums, yet cannot be admitted into the department of either, as it has not the feet of the former nor the tail of the latter. Its body is a uniform brown color, the tail being black. It is the size of a large rat, and is found in India and some of the Asiatic islands.

Fossil Rodentia.—The number of known species of Rodentia now existing is at least six hundred; from the fossil remains which have been discovered of Hares, Porcupines, Agoutis, Cavies, Dormice, Spermophiles, Jerboas, Gerbils, Field-Mice, Lemmings, Water-Rats, &c., we have rea-



PITHECHEIRUS MELANURUS.

son to suppose that the geological age of the world anterior to man was abundantly supplied with various families and tribes of this numerous and diversified order of animals.



ORYCTEROPUS CAPENSIS, OR AARD-VARK, AMONG THE ANT-HILLS.

ORDER 8. **EDENTATA.**

The word EDENTATA is derived from the Latin, and signifies *without teeth;* hence its application to this remarkable order, whose distinguishing characteristic is the total absence of the incisor teeth in all the species, with the exception of one Armadillo, in which a single tooth is found in each intermaxillary bone, but placed so completely at the sides, that the front of the mouth is quite destitute of teeth. The canine teeth are also deficient in most of the species, and some are even destitute of molars, so that the jaws exhibit no trace of teeth. The teeth that do exist are exceedingly simple in their construction and quite destitute of roots, and the formation of all the teeth is very similar. The structure of the skeleton varies considerably according to the particular habits of the animals; in some it is adapted for terrestrial progression, while in others it is remarkably fitted for climbing upon trees. The toes are furnished with very long and powerful curved claws. The skin is sometimes covered with hair, sometimes with horny or even bony scales or plates; the external ear is frequently wanting, and the tail varies greatly in its development, being sometimes of great length, sometimes rudimentary. The mammæ are two in number, and placed on or near the breast, and with the exception of the Armadillos, the species always produce a single young one at a birth.

The Edentata are all confined to the tropical parts of the world, and principally to the southern hemisphere. They are sluggish animals, for the most part nocturnal in their habits; some of them live upon vegetable and some upon animal food; the former are arboreal in their habits, while the latter are terrestrial, and generally burrow in the earth. They are mostly of small or moderate size; but the remains of some gigantic extinct species have been found in South America, which is the country in which the existing Edentata most abound. These are grouped in five families, as follows: the *Bradypides*, the *Dasypides*, the *Orycteropides*, the *Myrmecophagides*, and the *Manides*.

THE BRADYPIDES, OR SLOTHS.

In these animals, which are found only in the hottest parts of South America, the head is small and rounded, and the jaws short, so that the face projects very little in front of the cranium.



THE UNAU.

Both jaws are armed with molar and canine teeth; the molars are four in the upper, and three in the lower jaw, and of a nearly cylindrical form; the canines are very small. The tail is excessively short or entirely wanting. There are few animals which exhibit in a greater degree what appears to the careless observer to be *deformity* than the Sloth, and none that have on this account been more maligned by naturalists even of high standing. Buffon, and many of the older zoologists, were eloquent upon the supposed defects of the unfortunate Sloth. We are gravely told by these writers, that when the Sloth ascends a tree for the purpose of feeding on its leaves, it is so lazy that it will not quit its station until every trace of verdure is devoured nay, some of them went so far as to assert that when this was the case, and the Sloth was compelled to look out for a fresh supply of sustenance, it would not take the trouble to descend the tree, but just allow itself to drop from a branch to the ground. Even Cuvier, who ought to have known better, echoes this tale, and insinuates that Nature, probably becoming weary of perfection, "wished to amuse herself by producing something imperfect and grotesque" when the Sloths were formed; and he proceeds with great gravity to show the "inconvenience of organization" which in his opinion, rendered the Sloths unfit for the enjoyment of life.

It is perfectly true that on the ground these animals are about the most awkward creatures that can well be imagined, for their fore-legs are much longer than the hind ones; all the toes are terminated by very long curved claws, and the general structure of the animals is such as entirely to preclude the possibility of their walking on all fours in the manner of an ordinary quadruped. In this, which is an unnatural situation, they certainly appear to be the most helpless of animals, and their only means of progression consists in hooking their claws to some inequality in the ground, and thus dragging their bodies painfully along. But in their natural home, among the branches of trees, all these seeming disadvantages vanish, nay, the very peculiarities of structure which render the Sloths objects of pity on the ground, are found to adapt them the better for their true mode of existence.

The structure of the anterior extremities agrees very closely with that of the same parts in man, and these members possess great freedom of motion. The feet are, however, very different in their construction from the human hand; the bones are firmly united together, and give support to enormous claws, which are turned inward in repose, and rest against the palm. With these the Sloths cling firmly to the branches of the trees, from which they hang with their backs downward, and as it is in this position that most of their existence is passed, we can easily see that the mobility of the bones of the arms, coupled with a grasping arrangement, is peculiarly adapted to give them security and freedom of motion in their arboreal residence. Thus we perceive that

so far from being a mere freak of nature, the Sloth is specially fitted for enjoying a particular mode of existence, and that it is most absurd to come to any conclusion with regard to the powers of any creature from seeing it in an unnatural position. The Sloths seldom, if ever, visit the ground in a state of nature, and indeed have no reason for doing so, for in the great forests of South America, which they exclusively inhabit, the trees grow so close together that these animals can pass with facility from one to another, especially when strong winds wave the branches of the trees and thus bring them into closer juxtaposition.

Genus CHOLEPUS: *Cholœpus.*—Of this genus, to which Cuvier gives the name of *Tardigrada*, there is a single species, the *C. didactylus*—the UNAU of Buffon. The body of this is about two feet long; its head is large, its hair long and dry, and of a grayish-brown; the nostrils are circular. It uses three hands to hold on to the trees; the fourth it employs in seizing and bringing to its mouth such objects as it desires. It does not see well in the day, and remains a great part of the time hanging to the branches of trees, asleep. Mr. Waterton, in his "Wanderings" in South America, says, "The Sloth, in its wild state, spends its whole life in the trees, and never leaves them but through force or accident; and what is more extraordinary, not upon the branches, like the squirrel and monkey, but under them. He moves suspended from the branch, he rests suspended from the branch, and he sleeps suspended from the branch. Hence his seemingly bungled composition is at once accounted for; and in lieu of the Sloth leading a painful life, and entailing a melancholy existence upon its progeny, it is but fair to conclude that it just enjoys life as much as any other animal, and that its extraordinary formation and singular habits are but further proofs to engage us to admire the wonderful works of Omnipotence." Nor are the motions of this animal so slow while suspended in this strange position, nor his habitat so circumscribed as naturalists have hitherto imagined. "The Indians," continues Mr. Waterton, "have a saying that when the wind blows the Sloths begin to travel." In fact, during calm weather they remain tranquil, probably not liking to cling to the brittle extremities of the branches, lest they should break while the animals are passing from one tree to another; but as soon as the wind rises the branches of the neighboring trees become interwoven, and then the Sloth seizes hold of them and pursues his journey in safety. Species of this animal, which is found in Brazil and Guiana, have been in the menageries of Paris and of the London Zoological Gardens.



THE AI.

Genus BRADYPUS: *Bradypus.*—Of this there are several species: the AI, *B. tridactylus*, is varied with whitish-gray on the back, the hair being long and shaggy, and of a texture resembling dry hay in appearance. This covering looks so like the rough bark of a tree, mingled with moss, that the creature often escapes being noticed by men and animals which pursue them. It feeds on leaves and brings forth one young at a time. When moving in the forests it utters a cry of

ai! ai! whence its name. It is tenacious of life, and will move its legs half an hour after its heart and bowels are taken out. There are many varieties of this species, among which is the Yellow-faced Sloth, *B. gularis*. Certain naturalists hold that some of what are called varieties, are in fact distinct species.



THE COLLARED SLOTH.

The Gipakeiou, or Collared Sloth, *B. torquatus*, has a naked face of a black color; the hair is of a less withered look than that of the preceding; the forehead, temples, chin, and breast are covered with reddish or rust-colored hair, slightly frizzled; on the crown of the head it is long and yellow, and on the rest of the body, pale orange; but the most distinguishing mark of the species is a large black collar which completely surrounds the neck. Beneath the outer coat there is an inner one of very fine fur, which is of a dark brown color on the collar, but gradually diminishes in intensity toward the croup, where it is entirely white. In other respects this species resembles the Ai. It is found in Brazil.

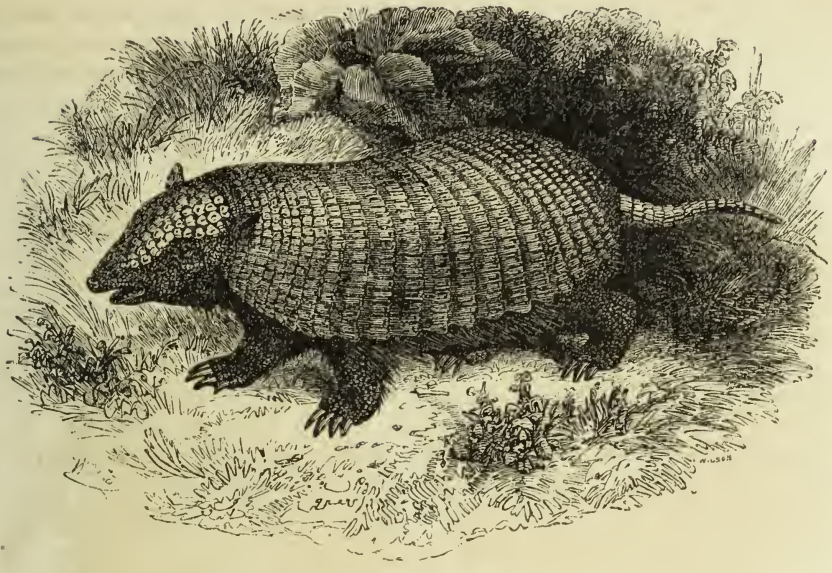
The Burnt-back Sloth, *B. ustus*, is chiefly distinguished by a faintish black line running along the back, accompanied by a large spot of yellow or orange color on each side.

THE DASYPIDES, OR ARMADILLOS.

The name *Armadillo* was given by the Spaniards, and means *clad in armor*, which is descriptive of the bony crust or coat of mail with which these animals are covered. The Portuguese applied to them the term *Encouberto*, which has a similar signification, and is now used as the title of one of the genera; *Tatou* is the Brazilian name, and is used by French writers instead of Armadillo. The scientific name *Dasypus* means *hairy-foot*, which was one of the old Greek names for the hare or rabbit; it is not descriptive of the animal in question, but it has become sanctioned by custom, and so its use is continued.

The Armadillos at first sight appear like reptiles, being of a broad squat form, and covered with a sort of bony shell, reminding one of the carapace of the tortoise; but on examination we find that it is not, like that, one connected and solid framework, nor does it extend under the belly. It consists of four parts, as follows: *first*, a buckler covering the head and neck; *second*, a buckler covering the shoulders and a part of the back; *third*, a buckler over the rump; and *fourth*, a series of broad bands across the loins. The form and relative size of these several parts vary in different species, but this general arrangement is observed in all, with a single exception, which we shall hereafter notice.

The substance of which this armor is composed is of a bony or horny nature, somewhat like



THE GIANT TATOU.—(See p. 467.)

tortoise-shell, and is hard and stiff, with a very slight elasticity, and is fastened by being attached to the skin of the body. It is formed of numerous small many-sided plates, placed contiguous to one another like mosaic or inlaid work. The buckler of the head, though thus composed of many smaller plates, is formed into one solid piece of armor, appearing ornamented like mosaic. The same may be said of the buckler over the shoulders, as well as that over the rump.

The bands across the loins perform a most important function, for while they, like the bucklers, are composed of a series of bony pieces, they are connected with each other by flexible skin, and being attached to the buckler before as well as that behind, they unite the whole, at the same time allowing complete freedom to the motions of the animal.

It is necessary, in order fully to comprehend the completeness of this system of defense, to state that the buckler of the head projects back so as to cover the neck, which, in order to suit this arrangement, is exceedingly short; it is also formed so as to lap over the edge of the contiguous buckler across the shoulders, and in a manner not to interfere with it. As the movable bands constitute that portion of the armor most easily used for adapting the whole to the size of the animal, they are not only movable, but variable in number and size. So that—as in man, if he outgrows his coat, it may be pieced and enlarged—if the Armadillo gets too big for his shell the bands are enlarged, or new ones formed to suit the emergency. In this curious arrangement there is, perhaps, nothing more wonderful than in the ordinary processes of nature in clothing the common quadruped with hair or the bird with feathers, but as it is a departure from the general system pursued in relation to this division of animated nature, it excites attention, and calls upon us to admire alike the resources of the Creative Power, and the perfectness of its work.

The throat, breast, belly, and thighs of the Armadillo are naked, or covered with a thick granulated skin, thinly furnished with warts or tubercles, which give origin to a few coarse bristly hairs. The commissures of the movable bands on the loins are likewise provided with a number of long hairs; but with this exception the body is covered only by its peculiar shell. The tail is straight, round, thick, and pointed; it is adapted at the root to a notch or cavity in the posterior edge of the buckler of the croup, and, with the exception of one species, is universally covered with bony rings, formed, like the rings of the bucklers, of numerous small pieces connected together, but capable of a certain degree of motion, and thus admitting of considerable flexibility in the tail itself.

The head of the Armadillos is flat and terminated by a pointed muzzle, which assists them, like the snout of the hog and mole, to turn up the earth in search of roots and worms. Their ears

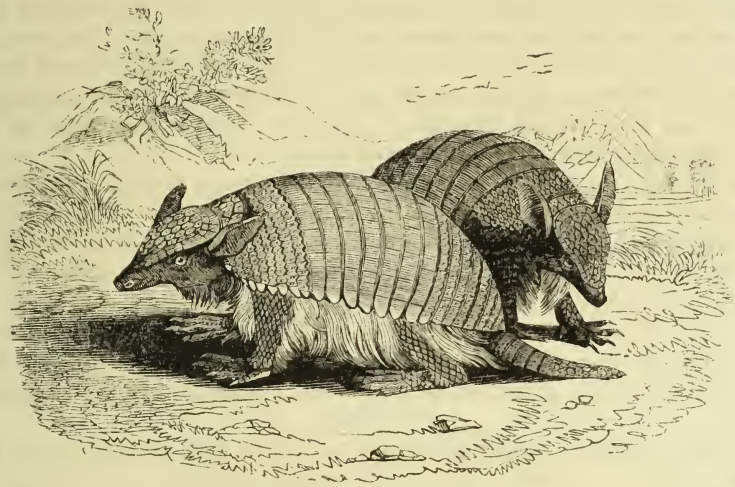
are erect and pointed, and their eyes very small. They have fat, corpulent bodies, and their legs are so disproportionately thick and short that they barely serve to elevate the body above the surface of the ground. Their toes, also, of which there are either four or five on the anterior, and invariably five on the posterior extremities, are remarkably short; but they are furnished with extremely long, powerful claws, slightly curved, and in every respect well adapted for digging or burrowing. So rapid, indeed, are the Armadillos at this operation, that they easily bury themselves to a depth beyond the reach of their pursuers. They can only be forced from their subterranean retreat by directing smoke or water into their burrows. Their strength and the tenacity of their hold are so great, that they have been known to leave their tails in the hands of the hunter rather than permit themselves to be drawn forth.

Notwithstanding the shortness of their legs and the clumsy formation of their bodies, the Armadillos run with considerable velocity. Most of the species will easily outstrip a man. Their ordinary burrows commonly run for three or four feet at an angle of about forty-five degrees to the plane of the horizon, then make a sudden bend, and terminate at a distance of eight or ten feet from the mouth. Here for the most part they conceal themselves during the daytime, for the greater number of the species are nocturnal, and never move abroad while the sun is above the horizon. This rule, however, admits of some exceptions—a few species being found abroad at all times; and it has been remarked that these are neither so swift nor so timid as the nocturnal species.

The teeth of the Armadillos are all of a simple cylindrical form, and stand apart from one another like those of the generality of cetacea and reptiles. They vary in number from seven or eight to seventeen or eighteen on each side of each jaw, and are so arranged that when the mouth is closed the upper teeth fit into the interstices of the under, and these into the interstices of the upper teeth, alternately. These animals seldom attempt to bite, nor has nature given them any other means of defense than their covering and the ease and rapidity with which they avoid danger by burrowing. Their food consists principally of fallen fruits, roots and worms; but they do not reject carrion, and have been known to penetrate into human graves when not properly protected by stones or brick-work. Azara informs us that ants seldom abound in the districts inhabited by the Armadillos, for these animals break into the ant-hills and devour the insects as greedily as the true ant-eaters. The Armadillos also eat the roots of the mandioc, potatoes, maize, and other similar substances of a vegetable nature. They are very destructive to the eggs and young of such birds as build their nests on the ground, and greedily devour frogs, small lizards, and even vipers. The chief animal food of the Armadillos, however, is derived from the immense herds of wild cattle which cover the plains and savannahs of every part of South America. These are rarely slaughtered but for the sake of the hide and tallow, and as the carcasses are left to rot on the ground, the smell soon attracts vast crowds of carnivorous animals of various species, and among others great numbers of Armadillos, which greedily devour the half-putrid flesh, and soon become extremely fat and corpulent. In this condition, notwithstanding the filthy nature of their food, their flesh is esteemed a great delicacy both by the native Indians and by the Portuguese and Spaniards of America. The animal is roasted in its shell, and is considered one of the greatest dainties which the country produces.

The Armadillos see but indifferently, particularly in bright sunshiny weather; but their sense of hearing is extremely acute, and amply compensates for any imperfection of sight. When alarmed by any unusual or strange sound they prick up their ears, stop for a moment to satisfy themselves of its distance and direction, then commence a precipitate retreat to their burrow, or, if that be too remote, begin to construct a new one. Smell is, however, by far the most acute of their senses. Azara tells a singular story, which strikingly illustrates the intensity of this sense in the Armadillos, as well as the unerring certainty with which, by a kind of intuitive knowledge of the principles of engineering, they are enabled to direct their subterraneous course to any particular point. "My friend Noséda," says he, "having arranged a trap for the purpose of taking Chibigouzous, and having placed in it, by way of bait, a cock with a small quantity of maize to support him, it so happened that a few grains of the maize fell through between the boards which formed the bottom of the trap. An Armadillo arrived during the night, and wishing to get at

the maize thus accidentally spilt, opened a trench or burrow at some distance from the trap, and without deviating a hair's breadth from the straight line of his direction, pushed it on to the very spot where the grain had fallen, and possessed himself of the booty!"



THE SIX-BANDED ARMADILLO.

Genus ENCOUBERT: *Euphractus.*—In the animals of this genus, that part of the carapace which covers the loins consists of six to ten broad movable bands, coming down the sides, but covering no part of the belly; the covering upon the rump, as well as that upon the neck and shoulders, come down in the same manner. The forehead, as well as the upper part of the tail, are also protected by the scaly armor.

The POYOU, or SIX-BANDED ARMADILLO, *E. sexcinctus*, is one of the species which has been long known, and was described by Buffon. The central bands are usually six, but the number varies. Its size is nearly that of a woodchuck, being about fourteen or sixteen inches long, but the form is flatter and more tortoise-like. It has, like the rest of its brethren, little stupid eyes, a keen-scented nose, sharp quick-hearing ears. Being provided with shield and buckler by nature, nature gave it no other defense, not even that of the courage or spirit to make battle when attacked. It is in fact a shy, timid little beast, living in its burrow or a crevice in the rocks by day, and stealing forth at night in quest of fruits, roots, maize, worms, and insects that chance to come in its way. It does not disdain carrion, and being a great frequenter of the pampas of Buenos Ayres, where it has a perpetual feast on the carcasses of cattle killed for their skins, it gets fat, and being esteemed a delicacy when roasted in the shell, it is killed and eaten in large numbers. In case of danger, this creature perhaps squats in the grass, and being nearly of the color of the earth, may pass unnoticed. If this does not answer, it runs, perchance, and pretty rapidly too, considering its short legs, dumpy form, and ordinary tortoise-like gait. If hard pressed, and the shape of the country favors, it will roll itself into a ball and tumble down the hills or rocks, and thus make its escape.

Beside this there are other species, among which are the PICHIY, *D. minutus*, and the HAIRY ARMADILLO, *D. villosus* of Desmarest.

Genus PRIODONTES: *Priodontes.*—Of this genus is the GREAT ARMADILLO, *P. gigas:* the GRAND TATOU of Azara; the GIANT TATOU of Cuvier. In this the carapace covers the body above and low down on the sides, but leaves the belly unprotected; the bands across the back are twelve to fourteen. It is the largest of the family, being three feet three inches long, with a tail nearly half the length of the body; its head is very small; its ears are of a moderate size, pointed, and habitually crouched backward; the tail is remarkably thick at the root, being upward of ten inches in circumference; it is gradually attenuated toward the tip, covered with plates disposed in rings at the base, and forming spiral or crescent-shaped lines throughout the

rest of its length. The claws are remarkably long and powerful. This species inhabits Brazil and the northern parts of Paraguay. It is never found in the open country, but keeps close to the great forests, and burrows with surprising facility. Those who are employed in collecting the Jesuit's bark frequently meet with it in the woods, and report that when any of their companions happen to die at a distance from the settlements, they are obliged to surround the body with a double row of stout planks to prevent it from being scratched up and devoured by the Great Armadillo.

Genus CABASSOU: *Xenurus.*—Of this there is a single species, the TATOUAY, or TWELVE-BANDED ARMADILLO: the *Cabassou Tatouay* of Gervais; the *Dasypus unicinctus* of Linnæus. Its general color is brown, its ears long, its anterior claws strong, the scales thinner than in the other species. It is nineteen inches long, and as the tail is naked and looks as if rudely deprived of its scaly covering, it is called by the natives the *Wounded Tatouay.* It is found principally in Guiana and Brazil.



THE TATOU-PEBA.

Genus CACHICAMA: *Cachicama.*—This includes the NINE-BANDED ARMADILLO, or PEBA, usually called TATOU-PEBA in Brazil, and which is found from Texas to Brazil. It is sixteen inches long, the tail fourteen; the circumference of the latter at the base is six inches. The head is small, long, and straight; the nose extremely elongated, taper, and terminated by a sort of small muzzle, something resembling the snout of a hog; the mouth is large; the eyes small, and placed on the sides of the head; the ears long, and placed close together; the tail long and attenuated; the legs short, and the feet small. The buckler of the shoulders extends in front over the whole neck, and toward the rear as far as the back, descending on each side to the elbows. It is composed of small pieces adhering to one another, and disposed in numerous parallel concentric rings, having the concavity toward the front, the first ring embracing the neck of the animal. The buckler of the croup extends from the back to the origin of the tail, and descends on each side to the knees. It is composed, as in the former case, of small pieces arranged in a great number of parallel concentric rings, passing transversely over the hips, but having their concavity turned in the opposite direction from that of the rings on the shoulder, or in such a manner that the last embraces the root of the tail. When viewed externally, the little pieces composing these bucklers have the appearance of irregular tubercles, but when examined on the under side of the buckler they are found to be hexagons almost as regular as those of the cells of bees, and fitted as precisely to one another. Between the bucklers of the shoulders and croup are interposed a variable number of transverse movable bands, marked with zig-zag lines forming very acute angles,

and in some degree gliding over one another according to the different motions of the animal. It is observed that the full-grown specimens always have the greatest number of bands, which renders it extremely probable that new bands are detached from the bucklers as they are required by the increasing growth of the animal. The buckler of the head descends from the ears to the muzzle, and covers each cheek as far down as the orbits; and there are small detached scales interspersed in various situations over the throat, the under-jaw, the legs, and feet, and even on the outer side of the ears. The tail is extremely long and taper; it is composed of a great number of osseous rings forming a long tubular case, and connected like the joints of a cane. Although this animal is not gifted with a fighting propensity, it will sometimes bite severely. It is endowed with great strength, and a tame one has been known to remove quite heavy boxes in order to form a retreat. It usually walks very slowly, but in case of extremity it runs quite fast. Its power of burrowing is very great. When occupied in this work, it often utters a faint squeak. Its favorite food is ants, but it diversifies its meals with vegetables and carrion, like the rest of its race. Its color is a reddish-brown, but as a portion of dust usually adheres to its shell, it generally appears much darker. It produces from three to four young at a time. It is usually hunted at night with dogs. This species is very abundant in Nicaragua: the inhabitants there often domesticate it for the purpose of keeping their houses clear of ants. It is said to be so abundant there as to be sold for six or eight cents each.

Another species of this genus is found in Paraguay and the neighboring countries, called the Mule Armadillo, *Dasypus hybridus*, which has from six to seven bands, and is smaller in size than the preceding, being only eleven inches long. It is common in the pampas of Buenos Ayres.

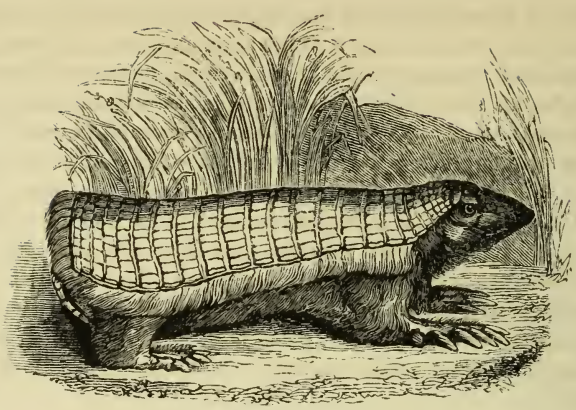


THE MATACO.

Genus APAR: *Tolypeutes*.—This includes the Mataco, Apara, or Three-banded Armadillo—the *Dasypus tricinctus* of Linnæus, the *T. tricinctus* of Gervais. It is about fifteen inches long, and having the faculty of rolling itself into a ball, is called *Belita*, or the Little Ball, by the Spaniards. This is in fact its usual mode of escape or defense, as the animal does not burrow, and has not sufficient speed for flight. The movable bands connecting the bucklers on the shoulders and rump are but three in number.

The Conic-tailed Apar, *T. conurus*, is of this genus, and is found in Brazil.

Genus CHLAMYPHORUS: *Chlamyphorus*.—The animals of this genus are the smallest of the armadillos, and their covering is more simple in its construction than that of any others. There is but a single species—the Pichiciago of the Indians of Mendoza, in South America, where it is found—*C. truncatus*. It is but about five inches long, and passes a great part of the time in its burrow, whence it is often compared to the moles. The female is said to carry her



THE CHLAMYPHORUS.

young beneath her scaly carapace. Very little is known of its habits, but it has attracted great attention by the peculiar form of its covering, which is about the consistence and thickness of sole-leather, and differing in form from that of all other armadillos. The tail is also very peculiar: it is a naked, jointed member, one inch and a half long, very strong, and flattened at the end, but is bent down and carried under the belly. It is supposed to be used like a spade to remove earth backward when the animal is digging its burrow.



THE AARD-VARK.

THE ORYCTEROPIDES.

Of this family there is a single genus and a single species, as far as known: this is the AARD-VARK, or AFRICAN ANT-EATER, *O. Capensis*. It is about three and a half feet long, the tail one foot nine inches. It has a long callous snout like a hog, a small mouth, and a slender tongue: this being covered with a glutinous saliva, the animal licks up the ants on which it feeds. These insects raise mounds of an elliptical figure to the height of three or four feet above the surface of the ground, and so numerous are these gigantic ant-hills in some parts of Southern Africa, that they are frequently seen extending over the plains as far as the eye can reach, and so close together that the traveler's wagon can with difficulty pass between them. They abound more especially in the Zeurevelden, or *Sour Districts*, so called from producing a kind of sour grass; are seldom found on the karroos or downs, and never in very dry or woody districts. By constant

exposure to the rays of a powerful tropical sun, they become so hard and indurated on the outer surface that they easily support the weight of three or four men, and even a loaded wagon will sometimes pass over without crushing them. Internally, these mounds are of a spongy structure, something resembling a honeycomb, and are so completely saturated with animal oil that they inflame without difficulty, and are an excellent substitute for wood or coal.

Wherever ant-hills abound the Aard-vark is sure to be found at no great distance. He constructs a deep burrow in the immediate vicinity of his food, and changes his residence only after he has exhausted his resources. The facility with which he burrows beneath the surface of the earth is said to be almost inconceivable. His feet and claws are admirably adapted to this purpose, and travelers inform us that it is quite impracticable to dig him out, as he can in a few minutes bury himself at a depth far beyond the reach of his pursuers; and further, that his strength is so great as to require the united efforts of two or three men to drag him from his hole. When fairly caught, however, he is by no means retentive of life, but is easily dispatched by a slight blow over the snout.

The Aard-vark is an extremely timid and harmless animal, seldom removes to any great distance from his burrow, being slow of foot and a bad runner, and is never by any chance found abroad during the daytime. On the approach of night he sallies forth in search of food, and repairing to the nearest inhabited ant-hill, scratches a hole in the side of it just sufficient to admit his long snout. Here, after having previously ascertained that there is no danger of interruption, he lies down, and inserting his long slender tongue into the breach, entraps the ants, which fly to defend their dwellings upon the first alarm, and mounting upon the tongue of the Aard-vark, get entangled in the glutinous saliva, and are swallowed by scores at a time. If uninterrupted, he continues this process till he has satisfied his appetite; but on the slightest alarm he makes a precipitate retreat, and seeks security at the bottom of his subterranean dwelling. Hence it is that these animals are seldom seen even in those parts of the country where they are most common. It often becomes very fat, and is much relished as food.



THE TAMANOIR, OR GREAT ANT-EATER.

THE MYRMECOPHAGIDES.

This family comprises the South American Ant-Eaters, of which there are several genera.

Genus MYRMECOPHAGA: *Myrmecophaga.*—Of this there is a single species, which is the largest and most remarkable of the family, the GREAT ANT-EATER, or TAMANOIR, *M. jubata*, sometimes called the *Ant-Bear*, an inhabitant of most of the tropical parts of South America eastward of the Andes, although apparently rather scarce everywhere. It is a large animal, a full-grown specimen measuring four feet and a half in length from the snout to the root of the tail, which in its turn measures nearly three feet in length. It is a most singular creature in its appearance. Its head is produced into a long snout covered with skin, which only leaves a very small opening or hole at the tip for the protrusion of the tongue; its ears are very small; its legs are rather long, and excessively stout, especially the anterior pair, the long powerful claws of which, four in number, are turned inward against the naked soles, so that the creature walks upon its knuckles. The hind-feet are furnished with a broad sole, and it is probably from this circumstance that it has been compared to a bear. The body is covered with harsh bristly hairs, which attain an immense length on the tail, from which they hang down perpendicularly so as to touch the ground. The prevailing color is grayish-brown, a broad black band, bordered with white, passing over each shoulder. When reposing, the Ant-Eater covers himself completely with his bushy tail, which gives the sleeping animal very much the appearance of a heap of dried grass, and he is said to resort to the same natural umbrella in case of a shower of rain; according to Mr. Wallace, the Indians are so well aware of this that when they meet with an Ant-Eater they shake the leaves to produce a sound like that of rain, and then knock him on the head while he is taken up with sheltering himself from the expected shower.

The habits of the Great Ant-Bear are slothful and solitary; the greater part of his life is consumed in sleeping, notwithstanding which he is never fat, and rarely even in good condition. When about to sleep, he lies upon one side, conceals his long snout in the fur of the breast, locks the hind and fore-claws into one another, so as to cover the head and belly, and turns his long bushy tail over the whole body in such a manner as to protect it from the too powerful rays of the sun. The female bears but a single young one at a birth, which attaches itself to her back, and is carried about with her wherever she goes, rarely quitting her, even for a year after it has acquired sufficient strength to walk and provide for itself. This unprolific constitution, and the tardy growth of the young, account for the comparative rarity of these animals, which are said to be seldom seen, even in their native regions. The female has only two mammæ, situated on the breast, like those of apes, monkeys, and bats.

In its natural state the Ant-Bear lives exclusively upon ants, to procure which it opens their hills with its powerful crooked claws, and at the moment that the insects, according to their nature, flock from all quarters to defend their dwellings, draws over them his long flexible tongue, covered with glutinous saliva, to which they consequently adhere; and so quickly does he repeat this operation, that we are assured he will thus project his tongue and draw it in again covered with insects twice in a second. He never actually introduces it into the holes or breaches which he makes in the hills themselves, but only draws it lightly over the swarms of insects which issue forth alarmed by his attack. "It seems almost incredible," says Azara, "that so robust and powerful an animal can procure sufficient sustenance from ants alone; but this circumstance has nothing strange in it for those who are acquainted with the tropical parts of America, and who have seen the enormous multitudes of these insects, which swarm in all parts of the country, to that degree that their hills often almost touch one another for miles together." The same author informs us that domestic Ant-Bears were occasionally kept by different persons in Paraguay, and that they had even been sent alive to Spain, being fed upon bread and milk, mixed with morsels of flesh minced very small. Like all animals which live upon insects, they are capable of sustaining a total deprivation of nourishment for an almost incredible time.

This strange animal is found in all the warm and tropical parts of South America, from Colombia to Paraguay, and from the shores of the Atlantic to the foot of the Andes. His favorite resorts are the low swampy savannahs, along the banks of rivers and stagnant ponds; he also frequents the humid forests, but never climbs trees, as reported by Buffon on the authority of Laborde. His pace is slow, heavy, and vacillating; his head is carried low, as if he smelled the earth at every step, while his long shaggy tail, drooping behind him, sweeps the earth on either side,

and readily indicates his path to the hunter; though, when hard pressed, he increases his pace to a kind of slow gallop, yet his greatest velocity never half equals the ordinary running of a man. So great is his stupidity, that those who encounter him in the woods or plains may drive him before them by merely pushing him with a stick, so long at least as he is not compelled to proceed beyond a moderate gallop; but if pressed too hard, or urged to extremity, he becomes obstinate, sits up on his hind-quarters like a bear, and defends himself with his powerful claws. Like that animal, his usual, and indeed only mode of assault, is by seizing his adversary with his fore-paws, wrapping his arms round him, and endeavoring by this means to squeeze him to death. His great strength and powerful muscles would easily enable him to accomplish his purpose in this respect, even against the largest animals of his native forests, were it but guided by ordinary intelligence, or accompanied with a common degree of activity. But in these qualities he is inferior to most other creatures; nevertheless, there is no reason to doubt that he does sometimes thus defend himself against the larger and more valorous animals which he meets in his native haunts.

Genus TAMANDUA; *Tamandua.*—Of this there is a single species, the TAMANDUA, *T. tetradactyla*, called the LITTLE ANT-EATER by the English, and FOURMILIER by the French: it resembles the preceding in form, but is much smaller, being only two feet two inches long, and the tail sixteen inches. The hair is short and shiny, and resembles both silk and wool. The color is very variable, and hence there are several varieties; some naturalists regard them as different species. The eyes are minute; the ears small and round; the body long and cylindrical; the legs short and robust; the tail round and attenuated, covered with very short hair throughout its greater part, but naked underneath toward the point, and strongly prehensile.

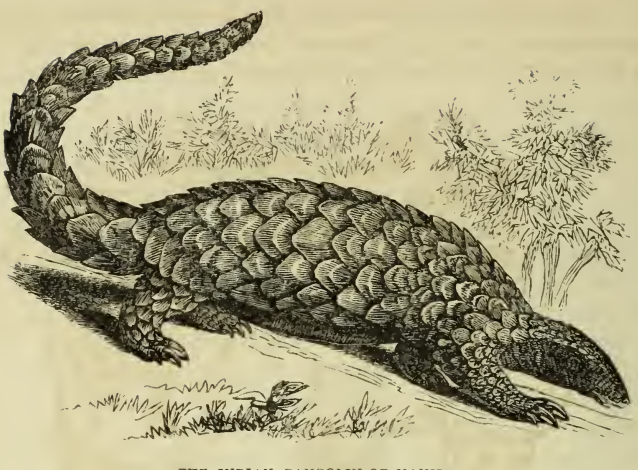
The Tamandua is an inhabitant of the thick primeval forests of tropical America; it is never found on the ground, but resides exclusively in trees, where it lives upon termites, honey, and even, according to the report of Azara, bees, which in those countries form their hives among the loftiest branches of the forest, and having no sting, are more readily despoiled of their honey than their congeners of our own climate. When about to sleep, it hides its muzzle in the fur of its breast, falls on its belly, and letting its fore-feet hang down on each side, wraps the whole tightly round with its tail. The female, as in the case of the great ant-eater, has but two pectoral mammæ, and produces but a single cub at a birth, which she carries about with her on her shoulders for the first three or four months. The young are at first exceedingly deformed and ugly, and of a uniform straw-color.

Brisson thinks an animal which is named *Fourmilier a queue annelée*, or the RING-TAILED ANT-EATER, is a distinct species.

The *Genus* MYRMIDON: *Myrmidon*—called *Didactyles* by F. Cuvier, *Dionyx* by Is. Geoffroy, and *Cyclothure* by Gray—presents a single species, the TWO-TOED ANT-EATER, *M. didactylus*. This animal is of the size of a small squirrel, the body being six inches long and the tail seven. In form it resembles the tamandua; it is of a straw-color, tinged with maroon on the shoulders; its habits are nocturnal; it lives in the trees, produces one cub at a birth, and feeds on insects. Like the other ant-eaters it is destitute of teeth, has a prehensile tail, two claws in front and four behind, and sits on its haunches in feeding. The inhabitants of Surinam, never seeing it eat when captured, and observing it to be frequently licking its paws, call it *Kissing-Hand*. It is found in Guiana and Brazil.

THE MANIDES OR PANGOLINS.

The animals of this family, which are sometimes called the *Scaly Ant-Eaters*, are not less peculiar in their external appearance than are the armadillos, for the upper part and sides of the body, as well as the legs and tail, are protected by numerous horny scales, imbricated one upon the other like the tiles of a roof, and implanted in the skin like nails. Their name *Pangolins* is said to be derived from the Javanese, *Pangoeling*, which means, *an animal that rolls itself into a ball;* in Bungalore the name is *Badjar Kita*, which means *Reptiles of stone.* They are without teeth, have an extensile tongue and two pectoral mammæ, subsist on ants and termites, are slow of motion, and have five toes on each foot.



THE INDIAN PANGOLIN OR MANIS.

Genus PANGOLIN: *Manis.*—Of this, the only genus belonging to the family, there are several species.

The Indian Manis—also called the Broad-tailed and the Short-tailed Manis—*M. laticaudata*, is supposed to be the *Phatagin* of the ancients. One of its Asiatic names is *Land-Carp;* with the Mahrattas it is called *Kuwlee Manjar*, or *Tiled-Cat.* Its head is small, pointed, and conic: muzzle elongated and narrow; body rather stout; tail short and very broad at its base; dorsal scales disposed in longitudinal rows to the number of eleven; under part of the body, head, and feet naked; some long fair-colored hairs spring from under the scales; the middle claw of the fore-feet far exceeds the others in its proportions. It is a native of the East Indies, coast of Tranquebar, Ceylon, &c. It feeds much on termites, or white ants, for the destruction of whose conical nests the great middle claw is admirably adapted. It seizes them very much in the manner of the ant-eaters, with its long, tensile, glutinous tongue. The Dutch call it the *Negumbo Devil*, and the Cingalese, *Caballe.* Thunberg informs us that the inhabitants of the latter country have a method of making a hole in its skin with a knife, and thus of guiding and governing the animal at their pleasure, the point of the knife, which is kept in the hole, goading and irritating it.

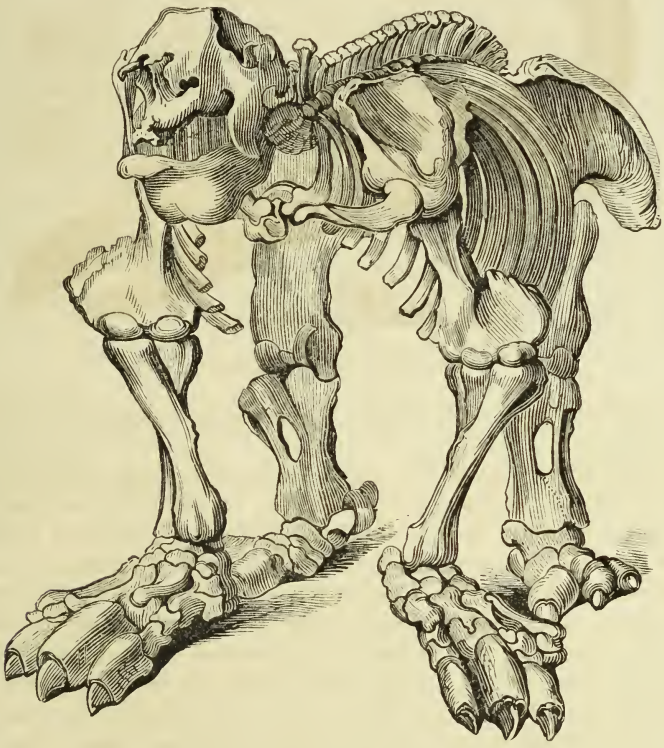
Temminck's Manis, *M. Temminckii*, has large scales arranged in eleven rows; the length of the body is about fourteen inches, and of the tail twelve; width of the back eight inches, and of the tail five inches, the latter being rounded and almost truncate at the end. It does not attempt to escape from man, but rolls itself into a ball, taking special care of its head. Ants constitute its chief and favorite food, and these it secures by extending its projectile tongue into holes which may exist in the habitations of these insects, or which it may itself form; and when, by means of the glutinous matter with which its tongue is covered, a full load has been received, a sudden retraction of the retractor muscles carries both into its mouth, after which the ants are immediately swallowed. This species is found in South Africa.

Other species of *Manis* or *Pangolin* are the *M. Dalmanni*, found in the environs of Canton, China, and called *Tchin-kian-kiapp* by the natives; the Rough Pangolin, *M. aspera*, of Sumatra; the Javanese Pangolin, or Tangillin, *M. Javanica*, of Sumatra, Borneo, and the Celebes, and Guy's Pangolin, *M. Guy*, found in Africa.

The Long-tailed Manis, or Pangolin, *M. longicaudata*, or *M. tetradactyla*—the *Phatagin* of Buffon—is a most extraordinary creature, having a body nearly two feet long, and a tail twice as long as the body. This is found in Senegal, Guinea, &c. Two other species of *Long-tailed Pangolins* or *Phatagins* are the *M. tricuspis* of Guinea, and the *M. tridentata* of Mozambique.

Fossil Edentata.—South America seems to be the theater on which, in times past as well as present, the order of Edentata has had its chief development. The gigantic nature of the remains of several species, now extinct, but bearing a general resemblance to existing races, is a subject of

ceaseless wonder.* In the Museum of Madrid, in Spain, is the skeleton of an enormous animal found twelve miles southwest of the city of Buenos Ayres, about the year 1789; and other similar skeletons, more or less perfect, have since been discovered in the same region. These have been



SKELETON OF MEGATHERIUM AT MADRID.

carefully examined by scientific men, and especially by Cuvier, and have been referred to a race of animals of gigantic proportions, once living in South America, but now extinct, to which has been applied the name of *Megatherium*. Of this Dr. Buckland gives the following eloquent sketch:

"The size of the *Megatherium* exceeds that of the existing *Edentata*, to which it is most nearly

* Remarks on Fossil Remains.—It does not come within the scope of this work to treat the subject of *Fossil Remains* much beyond the mere mention of the most important species. We have already given (see p. 7,) some general views on this subject, but at this point it may be well to add a few observations, suggested by the facts immediately before us. We have stated (p. 10,) the number of species of extinct animals, definitely classified, to be 25,000; Professor Bronn, of Heidelburg, has, however, given a much larger list of species actually discovered. Probably at this time (1858,) 35,000 may be known. The striking fact is disclosed by these discoveries, that in several classes of animals there are more fossil species than are now known to exist of the same genera. It seems probable that it will be found, in the further researches of science, that the same is true in respect to most or all classes of animals. Yet it is to be observed, that while the great types of animal creation are thus preserved through successive geological ages, doubtless embracing millions of years, nothing is to be found which supports the theory of a transmutation of one animal species into another, in a constantly improving and ascending scale, as has been suggested by some able writers. On the contrary, every animal seems to be of a distinct species, and must therefore have had a distinct creation. If a species dies out, though its semblance may remain, and perhaps in many forms, yet that is the end of its existence; it does not continue or revive in any manner or degree in any of the succeeding generations of its class. Nor does it appear that one species of animal is in any way connected with any other, except as analogous types in the Creative Mind. While the origin of things is generally hidden from human sight, we are here able distinctly to see, from period to period, the Act of God, extinguishing the lights of life and kindling others, similar indeed, but never the same. Man's creation, then, was not a development of a law, by which he was evolved from a chimpanzee or an orang-outang, as some philosophers teach; it was an Act of God, precisely such as the book of Genesis reveals. The Bible and Geology are here together in one of the most interesting points of human history—the origin of our being. God—not a Law, not an Abstraction, not a Principle—but God, breathed into man the breath of life, and he became a living soul. This is the threshold of faith, and is as clearly revealed by science as religion.

allied, in a greater degree than any other fossil animal exceeds its nearest living congeners. With the head and shoulders of a sloth, it combined in its legs and feet an admixture of the characters of the ant-eater, the armadillo, and the chlamyphorus; it probably also still further resembled the armadillo and chlamyphorus, in being cased with a bony coat of armor.* Its haunches were more than five feet wide, and its body twelve feet long and eight feet high; its feet were a yard in length, and terminated by most gigantic claws; its tail was probably clad in armor, and much larger than the tail of any other beast among extinct or living terrestrial Mammalia. Thus heavily constructed, and ponderously accoutered, it could neither run, nor leap, nor climb, nor burrow under the ground, and in all its movements must have been necessarily slow; but what need of rapid locomotion to an animal whose occupation of digging roots for food was almost stationary? And what need of speed for flight from foes, to a creature whose giant carcass was encased in an impenetrable cuirass, and who, by a single pat of his paw, or lash of his tail, could in an instant have demolished the cougar or the crocodile? Secure within the panoply of his bony armor, where was the enemy that would dare encounter this leviathan of the Pampas; or in what more powerful creature can we find the cause that has effected the extirpation of his race? His entire frame was an apparatus of colossal mechanism, adapted exactly to the work it had to



MEGATHERIUM RESTORED, ACCORDING TO THE DESIGNS OF W. HAWKINS.

do; strong and ponderous, in proportion as this work was heavy, and calculated to be the vehicle of life and enjoyment to a gigantic race of quadrupeds, which, though they have ceased to be counted among the living inhabitants of our planet, have, in their fossil bones, left behind them

* Since the delivery of these opinions it has been pretty clearly proved that the Megatherium had no such covering as is here supposed.

imperishable monuments of the consummate skill with which they were constructed. Each limb and fragment of a limb formed co-ordinate parts of a well-adjusted and perfect whole, and through all their deviations from the form and proportion of the limbs of other quadrupeds, afforded fresh proofs of the infinitely varied and inexhaustible contrivances of creative wisdom."

But this animal, which must have greatly exceeded the elephant in size and weight, was not the only geological wonder of this part of the world. The bones of an extinct animal, called by geologists the *Mylodon*, and nearly the size of a hippopotamus, have been discovered at various times in South America, and a complete skeleton has been obtained and placed in the Hunterian Museum of London. This is eleven feet long from the snout to the end of the tail. It has been proved that this creature fed on vegetables, and probably pulled down trees of considerable size and fed on the leaves and branches. It seems to have combined something of the organization of both the sloth and the armadillo, but in some respects it was unlike any known animal. It is probable that there were several species of Mylodon.

Another geological curiosity, belonging to the Edentata of this quarter of the world, was the *Glyptodon*, a species of gigantic armadillo, the remains of which have been found in various places. The entire length of one of these creatures was probably fourteen feet. The carapace of

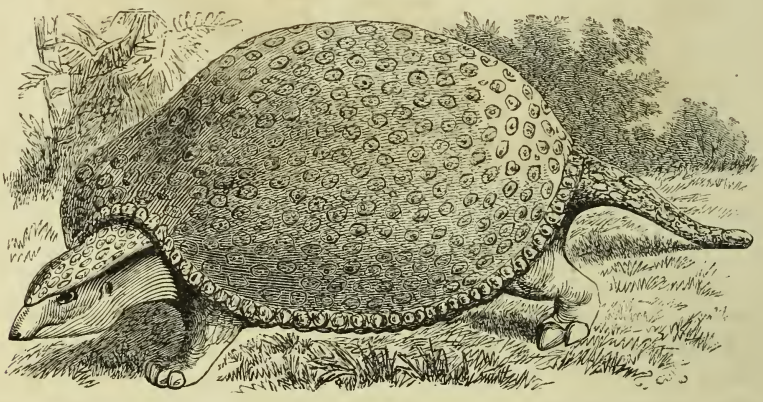


SKELETON OF THE MYLODON.

one of them is preserved in the Museum of the Royal College of Surgeons, London, and appears like part of a huge cask. This covering is composed of horny plates, not disposed in rings or bands, as in the armadillo, but articulated together, and forming a tesselated cylinder or arch. The tail was inclosed in a scabbard of this nature. These are some of the revelations of geology

in South America. To these facts we may add, in the words of the intelligent English traveler Darwin, that "the Pampas may be regarded as one great sepulcher of lost quadrupeds." From an examination of the soil, it appears that this immense prairie—now exhibiting a sea of waving grass for eight hundred miles—occupies the site of what was once an immense bay or arm of the sea. In the countless ages of the past this has gradually been filled by soil, and in this are embedded the relics of these various races which have passed away. Not only are here found the relics we have described, but many others, including those of the *Toxodon*, strangely blending in its structure some of the organic features of the rodentia, ruminantia, and cetacea,—those of the *Macrauchenia*, which alike resembled the tapir, the camel, and the giraffe; and many others equally strange and wonderful.

In listening to these and similar accounts, especially those which relate to the *Mastodon*, the *Mammoth*, the *Megalonix*, the *Iguanodon*, and other giants of the geological ages, it is natural to ask by what means did these creatures, the seeming masters as well as monsters of the world, cease to exist? The answer is for the most part supplied by well known facts. In some cases the earth has been submerged by convulsions of nature, sudden or slow, and its tenants have been swallowed up in the sea; in others, there have been great changes of climate, rendering whole regions unfit, alike by their temperature and their productions, to sustain the animals which before inhabited them. And, finally, it may be stated that all very large animals seem destined, by a sort of necessity, to pass away. These enormous creatures were few in number, for the earth could not sustain many, and multitudes of smaller animals combined for the destruction of such as did exist, as they do now. It is true that in the eras to which we refer, Man,



THE GLYPTODON ACCORDING TO THE DESIGNS OF W. HAWKINS.

the great destroyer, was not there, but there were lions, tigers, hyenas, and bears, to devour the young, to attack and destroy the sick and disabled. There were myriads of animals to penetrate the bowels and perforate the skin, to inflict disease and occasion death. With combinations of these and other creatures lay the strength of the world, and to them its dominion gradually tends. In short, these enormous animals were not adapted to the earth, in its actual state, and so, by the laws of nature, some in one way and some in another,—they ceased to exist, leaving no record but their bones.



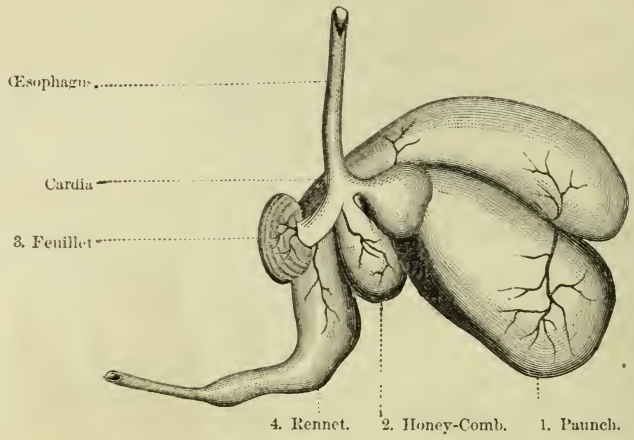
ORDER 9. **RUMINANTIA.**

We now come to those animals which *chew the cud*, and which are therefore called *Ruminantia*. They are, of all others, those which are most useful to man: they furnish him with food, and nearly all the flesh he consumes; some serve him as beasts of burden or draught; others with their milk, their tallow, leather, horns, hair, wool, and other products. The Ruminantia were regarded by Cuvier as the most natural and the best determined order of the class, for all the species which compose it appear to have been constructed on the same model, the camels alone presenting some inconsiderable exceptions to the general characteristics of the group.

The first of these characteristics is that of having no incisors in the upper jaw, while the inferior has always eight, the two outermost of which represent canines. They are replaced above by a callous pad. Between the incisors and the molars is a wide space, where, in some genera, there are one or two canines. The molars, almost always six in number above and below, have their crown marked with two double crescents, the convexity of which is turned inward in the upper, and outward in the lower jaw. The fore-feet are each terminated by two toes and by two hoofs, which present a flat surface to each other, appearing as though a single hoof had been cleft; hence the names that have been applied to these animals of "cloven-footed," "bifurcated," &c. Behind the hoof there are always two small spurs, which are vestiges of lateral toes. The two bones of the metacarpus and metatarsus are united into a single one, designated as the *cannon-bone*, but in certain species there are also vestiges of lateral, metacarpal, and metatarsal bones.

The name *Ruminantia* intimates the singular faculty possessed by these animals of *chewing the cud*, that is, of masticating their food a second time, it being returned to the mouth for this purpose after the first deglutition. This faculty depends on the structure of their stomachs, which

are always four in number, the first three of which are so disposed that the food may enter into either of them at the will of the animal, the œsophagus terminating at the point of communication.*



STOMACH OF THE SHEEP.

The first and largest stomach is named the *Paunch.*† It receives a large quantity of vegetable matter, coarsely bruised by the first mastication. From this it passes into the second, termed the *Honey-comb Bag*, the parietes or inner sides of which are laminated like the cells of bees. This second stomach, very small and globular, seizes the food, and moistens and compresses it into little pellets or *cuds*, which afterward successively return to the mouth to be rechewed. The animal remains at rest during this operation, which lasts until all the herbage first taken into the paunch has been subjected to it. The aliment thus remasticated descends directly into the third stomach, termed the *Feuillet*, on account of its parietes being longitudinally laminated, somewhat like the leaves of a book, from which it descends into the fourth, or *Caillette*, or *Rennet-bag*, the coats of which are wrinkled, and which is the true organ of digestion, analogous to the simple stomach of animals in general. In the young of the Ruminants, while they continue to subsist on the milk of the mother, the *caillette* is the largest of the four. The paunch is only developed by receiving great quantities of herbage, which finally give it enormous volume. These animals have the intestinal canal very long, but there are few enlargements in the great intestines. The

* Blumenbach observes that the first three stomachs are connected with each other, and with a groove-like continuation of the œsophagus, in a very remarkable way. The latter tube enters just where the paunch and the second and third stomachs approach each other; it is then continued with the groove, which ends in the third stomach. This groove is therefore open to the first stomachs, which lie to its right and left. But the thick prominent lips which form the margin of the groove admit of being drawn together so as to form a complete canal, which then constitutes a direct continuation of the œsophagus into the third stomach. The functions of this very singular part will vary according as we consider it in the state of a groove or of a closed canal. In the first case, the grass, &c., is passed, after a very slight degree of mastication, into the paunch, as into a reservoir. Thence it goes in small portions into the second stomach, from which, after a further maceration, it is propelled, by a kind of antiperistaltic motion, into the œsophagus, and thus returns into the mouth. It is here ruminated and again swallowed, when the groove is shut, and the morsel of food, after this second mastication, is thereby conducted directly into the third stomach. During the short time which it probably stays in this situation between the folds of the internal coat, it is still further prepared for digestion, which process is completed in the fourth or true digestive stomach.

It is further said that the shutting of the groove when the food is again swallowed after rumination, supposes a power of voluntary motion in this part, and indeed, it is added, the influence of the will in the whole affair of rumination is incontestable. It is not confined to any particular time, since the animal can delay it according to circumstances when the paunch is quite full. It has been expressly stated of some men, who have had the power of ruminating—instances of which are not very rare—that it was quite voluntary with them. "I have known," continues Blumenbach, "two men who ruminated their vegetable food; both assured me that they had a real enjoyment in doing this, which has also been observed of others; and one of them had the power of doing it or leaving it alone, according to circumstances."

† Various names are given to the different stomachs of the Ruminantia: the first, or *Paunch*, is called *Rumen*; the second, or *Honey-comb Bag*, is called *Bonnet*, *King's Hood*, *Reticulum*, *Ollula*, *&c.*; the third, or *Feuillet*, meaning two leaves of a book, is called *Manyplus*, *Psalterium*, *&c.*; the fourth, or *Rennet*, is called *Abomasus*, *Faliscus*, *&c.*

cœcum is likewise long, and tolerably smooth. Their fat hardens more by cooling than that of other quadrupeds, and even becomes brittle, and is commonly termed *tallow*. The udder is placed between the hinder limbs. In their forms, many of these animals are light and elegant, and are endowed with great speed. The skin is covered with hair or wool, the eyes are large and full, and in many species exceedingly beautiful.

The Ruminantia are divided into five families, as follows: the *Bovidæ*, the *Giraffidæ*, the *Cervidæ*, the *Moschidæ*, and the *Camelidæ*.

THE BOVIDÆ.

This family includes the following tribes: the *Bovina* or *Ox kind*, the *Caprina* or *Goat kind*, the *Ovina* or *Sheep kind*, and the *Antilopina* or *Antelope kind*.



DOMESTIC CATTLE.

THE BOVINA.

This tribe embraces the various animals of the Ox kind, a genus to which the "Lord of Creation" is most extensively indebted. It has been observed that if the qualities of the dog are of a higher and more intellectual character, and bring it into closer communication with man as a social being; and if the horse, as a beast of burden and of draught, contributes more to his immediate personal gratification, the Ox surpasses these and all others in the devotion of its powers while living, and the appropriation of every part of the body when dead, to the wants, the comforts, and the luxuries of its owner. It is a small but very natural genus, all the species of which resemble each other in essential points, and manifest little approximation to other genera. Some of them have been, in different countries, subdued to the service of man, and their great strength made available for the purposes of husbandry, and in some instances, of riding and draught. They are mostly large, thickset animals, with stout limbs, a broad muzzle, and a pendulous dewlap; the horns, found in each sex, are round, pointed, and curved, supported on a bony center, which is very porous. Their flesh, on the whole, is the most nutritious, the most digestible, and the most agreeable of all animal food, and is the most extensively consumed.

Different authors have classed these animals in various ways, some regarding them as of a single genus, others as of a single species, and still others as constituting several genera. We shall adopt the arrangement of Gervais, which seems the most natural, and treat them as consisting of one Genus, OX, *Bos*, and divided into six subgenera, *Bibos*, *Yak*, *Bonasus*, *Buffalo*, *Ovibos*, and *Taurus*. Before we proceed, however, we present to the reader the following curious table, furnished by Mr. Vasey in his "Delineation of the Ox Tribe," showing the differences in the number of vertebræ belonging to the several species and varieties of *Bovina*.

Names of Species.	Cervical.	Dorsal.	Lumbar.	Sacral.	Caudal.	Total.
American Bison	7	14	5	5	12	43
European Bison	7	14	5	5	19	50
Yak	7	14	5	5	14	45
Gayal (Domestic)	7	14	5	5	16	47
Indian Buffalo	7	13	6	5	16	47
Gaur	7	13	6	5	19	50
Domestic Ox	7	13	6	5	21	52
Manilla Buffalo	7	13	6	5		
Cape Buffalo	7	13	6	4	19	49
Zamouse	7	13	6	4	20	50
Banting	7	13	6	4	18	48
Zebu	7	13	6	4	18	48

Subgenus BIBOS: *Bibos* of Hodgson.—Of this there is a single species, the JUNGLE-OX, or JUNGLE-GHAU of India, the *Bos frontalis* of Lambert, and the *Bos sylhetanus* of F. Cuvier. In Oriental language it is called *ghau*, which means *cow*, whence we have *Nylghau*, which means *Blue-cow*. The English give to the *Jungle-Ox* the various names of *Gauri-Ghau*, *Gayal*, and *Bison*. The entire body of this species is red, and the feet whitish; the size is that of the common domestic ox; the horns are arched and marked with ridges, transverse to their base. It is widely distributed, extending from Hindostan to Cochin China. It lives in small herds in dense forests and marshy thickets, and is endowed with such strength and courage that it easily defends itself from the most formidable beasts of the wilderness. It is, however, of a mild disposition, and is not dangerous even in its own dominions. It is domesticated and bred by some of the Hindoos, who only make use of the flesh and hides, though the milk has a peculiar richness. In some instances it is said to be used for draught. The cow goes eleven months, and will breed with the common Indian bull. Large flocks of these animals are owned by some of the natives; they roam at large during the day, but come home at evening, being trained to this by receiving small quantities of salt. Some Hindoos regard this as a sacred animal.

The GAUR or GOUR, *Bos Gaurus* of Smith, is regarded by some naturalists as a distinct species. It is found in the mountainous parts of Central India, where it lives in small herds, and is a wild and savage animal.

The BANTING or SUMATRA OX, *Bos Banting*, is a wild species, found in Java and Borneo; it resembles the Gaur in appearance, but its osteology is peculiar, and it is doubtless a distinct species.

Subgenus YAK, or PŒPHAGUS, according to Gray.—Of this there is one species only, the YAK, SARLYK, or GRUNTING-OX, GRUNTING-BULL, SAVORA-GOY or BULBUL, the *Bos Grunniens* of Linnæus. The color of this animal, of which there are wild as well as tame varieties, is black; the back and tail often white; the hair is thick and long, and the tail is long, silky, and beautiful. It is used for military standards, and, being dyed red, is employed for tufts to the caps of the Chinese. Both the male and female have a constant grunt like that of a hog. On the shoulders is a hump, covered with long hair. The horns are like those of a common ox. This species is extensively bred in Thibet and the adjacent parts of Central Asia, where it is extremely useful to the inhabitants. There are several breeds, as the *Noble Yak*, the *Plow Yak*, *Ghainorik*, *Wild Yak*, &c. Those used for the plow are short-legged, carry their heads low, and have a mean aspect. Those used for riding, which, by the way, are guided by the nose, are much handsomer, and have a stately appearance. They are, however, somewhat vicious, kick, turn round and grunt, sometimes furiously, and with a kind of rattling in their throat. This



THE YAK.

species breeds with common cattle, and the mixed races are greatly valued. They seem to be adapted to cold countries, and thrive best in the lofty plateaus between the Altai, Himalaya, and Belur Tag mountains. In summer the wild kinds shrink from the heat, and hide themselves in the shade and water. The young are produced in winter; these are at first covered with rough, curly black hair; at three months they obtain the long hair on the body and tail.

Several living specimens of the Yak have been taken to Europe, and in France the experiment is being made of bringing them into use, it being deemed a valuable breed on account of its long hair, and other qualities. Several young ones have been produced there.

Subgenus BONASUS or BISON: *Bison* according to Smith.—Of this there are two species, one European, and now nearly extinct; the other American, and still existing in large numbers. These animals are chiefly distinguished from the ox by having the forehead much larger and more rounded between the horns; the feet smaller, with a thicker and more woolly covering; and, finally, by possessing one more rib—that is, fourteen instead of thirteen.

The European species of Bison is the Aurochs, the *Bos Bonasus* of Linnæus. This animal, which was formerly, though erroneously, supposed to be the origin of our domestic cattle, was once spread throughout the forests of Europe, but has gradually disappeared before the approach of man, and is now only known in the remote parts of Lithuania, Moldavia, Wallachia, and parts of the Caucasus. As found at the present day, it has a very broad head and arched forehead; the eyes are large and dark; the hair on the forehead is long and wavy, and under the chin and breast forms a kind of beard. In the winter, the whole of the neck, hump, and shoulders are covered with a long dusky-brown hair, intermingled with a soft fur. The long hair is cast in the summer and renewed in the winter. The tail is of moderate length, covered with hair, and is terminated in a large tuft. The females are not so large as the males, and have not so much hair on their bodies.

These animals have never been domesticated, but herds of them are protected in certain localities in the forest of Bialowieza in Lithuania, under the direction of the Emperor of Russia. There are twelve herds thus kept, each being under the superintendence of one herdsman. The estimated number of all the herds is eight hundred, these not including the wild troops of the Caucasus. They feed on grass and brushwood, and the bark of young trees, especially the willow, poplar, ash, and birch. They do not attain their full stature till their sixth year. They are very shy, and can only be approached from the leeward, as their smell is exceedingly acute. When accidentally fallen in with they become furious, and passionately assail the intruder. When taken young they become accustomed to their keeper, but the approach of other persons excites their anger. Two



THE AUROCHS.

young specimens were presented to the Zoological Society of London by the Emperor of Russia. The history of their capture, as told in a letter from M. Dimitri to Sir R. Murchison, is interesting, and is substantially as follows:

"On the 20th July, 1846, at daybreak, three hundred and eighty huntsmen, armed with guns simply charged with powder, placed themselves on the track of a herd of bisons which had been discovered during the night. Having penetrated deep into the valley with the utmost precaution, they suddenly came upon them. The creatures were reposing upon the side of a hill, ruminating in security, while the young ones were frolicking around their dams, attacking one another, and tearing up the earth with their hoofs, making the sand fly in whirls around them. One moment they would go to the side of their mother, rub their heads caressingly upon her and lick her sides; at another, they turned round to rejoin their comrades and share their frolics.

"But at the first sound of the horn the scene changed in the twinkling of an eye; the whole troop, as if struck by a magic wand, jumped to their feet, and seemed to concentrate all their faculties to see and to hear what was going to take place. The calves pressed timidly against their mothers, and when the baying of the hounds was heard, the old bisons ranged themselves in the order they are accustomed to take on such occasions. Placing the calves in front, they brought up the rear to save them from the pursuit of the dogs. On their arrival at the station held by a portion of the huntsmen, they were received by piercing cries and the discharge of their guns. Upon this they changed their order of defense; the old bulls threw themselves furiously upon the sides of the besieging party, broke their line of attack, and, victorious at this point, continued their furious course without stopping to chastise their enemies, who were concealed behind the largest trees. The huntsmen had, however, succeeded in separating two calves from the herd. One of them, three months old, was taken immediately; the other, a year older, made great resistance. Although seized and held by eight men, he threw them over, and succeeded in escaping. They then set on the dogs. He was soon driven into a swamp, dragged out, tied by the legs, and carried to the keeper's lodge.

"Four other calves, one male and three females, were taken in other parts of the forest. One of these females, which was only two or three days old, was at first suckled by a domestic cow, which, contrary to the idea of some writers, took immediate care of the young foundling, and showed a great affection and tenderness for her forest child. Unhappily, the young creature died six days after, suffocated by some throat complaint, which it had when it was taken.



THE AMERICAN BISON.

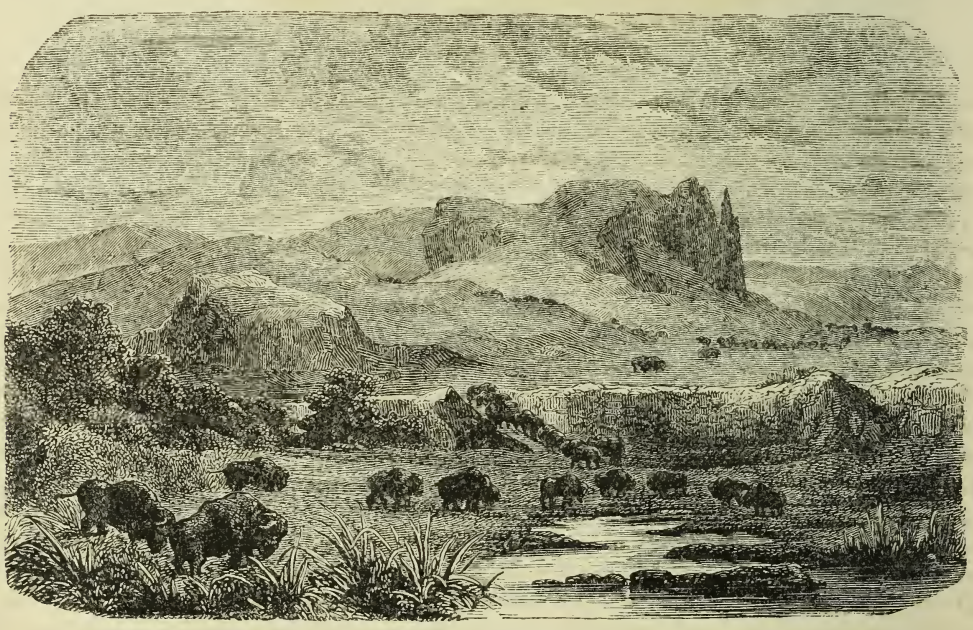
"The other calves took no nourishment on the first day of their captivity; but the next, the one of three months of age began to suck one of the cows, and appeared very gay. His companions in captivity, except one of fifteen months old, began by first drinking some milk from the hand, then they drank greedily from a pail, and as soon as it was empty they began to lick each other. In a short time they lost all their savage manners, which gave place to an extreme vivacity and petulence. When they were taken out of their stable to go into the large barn-yard, the rapidity and lightness of their movements were like those of deer. They frolicked with the domestic calves around them, fought with them, and, though apparently much stronger, appeared to yield through complaisance. The male aurochs of fifteen months, kept a long time his savage and solitary manners; he became angry at the sight of a man, shook his head, brandished his tail, and menaced with his horns. After two months' captivity, however, he became tame and attached himself to the peasant who fed him. He then had more liberty given to him."

Two of the animals thus taken, were sent to London, and placed in the Zoological Gardens, as already stated, but, unfortunately, they died soon after.

The American Bison, *Bos Americanus*, the only bovine animal indigenous to America, and confined exclusively to North America, has many points of similarity with the Aurochs. In both we have the huge head and the lengthened spinal process of the dorsal vertebræ for the attachment of the brawny muscles that support and wield it. In both, we have the conical hump between the shoulders in consequence, and the shaggy mane in all seasons; and each presents a model of brute force, formed to push and throw down. When full-grown the American animal is fully the size of our oxen, and weighs from 1,600 to 2,200 pounds. When fat it yields one hundred and fifty pounds of tallow. The head is very large, and carried low; the eyes are small, black, and piercing; the horns are short, small, sharp, set far apart,—for the forehead is very broad,—and directed outward and backward, so as to be nearly erect, with a slight curve toward the outward-pointing tips. The hump on the shoulder is not a mere lump of fatty secretion, like that of the zebu, but consists, exclusive of a deposit of fat which varies much in quantity, of the strong

muscles attached to the highly-developed spinous processes of the last cervical and first dorsal vertebræ, forming fit machinery for the support and movement of the enormous head. The chest is broad, and the legs are strong; the hind parts are narrow, and have a comparatively weak appearance. The tail is clothed with short fur-like hair, with a long, straight, coarse, blackish-brown tuft at the end. In winter, the whole body is covered with long shaggy hair, which in summer falls off, leaving the blackish wrinkled skin exposed, except on the forehead, hump, fore-quarters, under-jaw, and throat, where the hair is very long and shaggy, and mixed with much wool. The general color is brownish-black, the under surface being of a lighter shade. The female resembles the male, but is somewhat smaller and of a more delicate structure.

When the Europeans began to form settlements in North America, the bison was occasionally, though very rarely, met with in the regions near the Atlantic; it was, in fact, uncommon east of the Apalachian chain. As early as the first discovery of Canada it was unknown there. It was found tolerably abundant in Kentucky, but the center of its haunts has been, and still is, the great plain between the Mississippi and the Rocky Mountains, from latitude 64° south. Here, though man—civilized and savage—has made incessant war upon them for a century, and has



HERD OF BISONS.

greatly diminished their numbers, they still roam in vast herds, migrating from one prairie to another, as their necessities in respect to pasture demand. A herd of these enormous beasts, sometimes amounting to five, ten, and even twenty thousand, stretching as far as the eye can reach, over the undulating plains—some bellowing, some fighting, some tearing up the soil—the very earth trembling beneath the shock, and the air filled with a prolonged and portentous murmur—is said to present a spectacle at once appalling and sublime.

The breeding season of the bison is in June and July. The females, either singly or several together, retire to some solitary spot, remote from the haunts of wolves and bears, and produce their young, usually one at a time, and in the months of May or June. These follow the mother till the next season. When they are attacked by wolves, the cow bellows and runs at the enemy, and sometimes frightens him away. The migrations are generally from north to south in autumn, and from south to north in spring. Some remain in the northern regions through the winter, and dig away the snow to get at the grass. In some seasons many of them, however, perish. They swim the great rivers of the West, on which occasions many of the calves are drowned from being unable to climb the steep or miry banks. On such occasions the mothers



THE TAME BUFFALO.

may be seen watching the efforts of their offspring with intense anxiety, but unable to render them any assistance, and only uttering troubled moans; often, the calves get on the backs of their mothers, and are thus carried over the streams in safety. Sometimes in crossing the ice a herd is ingulfed, and many of them perish.

In the spring the bison bulls select their mates and do not leave them till these retire for their parturition. The battles among the males for a particular female are often terrible. On these occasions the contest is preluded by bellowings and tearing up of the earth after the manner of civilized bulls. When the combatants rush to the encounter, striking their heads together, the shock is altogether terrific. As a large herd moves along they keep up a perpetual bellowing, and it is said they may be heard ten miles on a fine day. In their migrations the multitude move irregularly forward in a slow walk; but when necessity requires these animals can gallop nearly as fast as a horse can run. Some of the fat, old bulls, however, like pursy old gentlemen, are incapable of such flights. The cows and calves are much the fleetest. In lying down and rising the action of the bison is nearly the same as that of our domestic cattle.

The Bison presents many inducements to the hunter for its capture: the horns are used for many purposes, the hide is valuable as a covering, the flesh is excellent—some parts, indeed, as the tongue and the hump, delicious. It is not surprising, therefore, that various methods are resorted to by the Indians—several tribes of which live almost entirely on their flesh—in hunting these animals. Sometimes the dry prairie-grass is set on fire in a circle, and maddened by fright, the poor animals rush into openings, where the deadly rifle awaits them Sometimes they are driven over ledges of rocks, and either killed or fatally wounded in the plunge; sometimes they are enticed into a large inclosure made of stakes and branches of trees, where they are easily dispatched; sometimes the hunter approaches the herd on horseback, and selecting a particular animal, lays him prostrate by a bullet or an arrow, which is sent with such force as to pass quite through the body. Nor are the Indians the only slayers of these beasts: white hunters—some who make it a trade, some who are only seeking sport—and not a few are attracted hither, as well from different portions of the United States as from various parts of Europe—are constantly plying the deadly rifle against these herds. At the same time, numerous bands of wolves are mingled with the flock, attacking and pulling down the young, the sick, the lame, the wounded, the lonely, and the defenseless. Catlin, with terrible fidelity, has painted some of these hunting scenes—not only the attacks of the Indians upon the herd, but those of the prairie-wolves, encircling, for instance, some wounded bull, who, although his eyes are torn from their sockets, his tongue eaten off, and his bowels gushing out and being ravenously devoured by his hideous assailants, still stands and—blind, bleeding, and staggering—bravely faces and threatens his enemy. The grizzly bear is also a terrible destroyer, and the strongest of the train falls helpless beneath the shock of



THE ARNA.

his attack. Under such a process, it is obvious that these creatures, numerous as they are, are rapidly being diminished, and the time cannot be remote when they will be, like the Aurochs of Europe, a race of former days, with only a vestige of their countless herds to transmit their semblance to succeeding generations.

It appears that the American Bison is not naturally a very timid or savage brute; but at present, being constantly harassed by hunters, it is exceedingly watchful, and unless when large herds are together, it can only be approached from the leeward, and under cover. The natural disposition of the animal is to fly from man, but when wounded he turns on his enemy, and is alike furious and formidable. The Bison has never been effectually tamed so as to be serviceable for the use of man. It has been known to breed with domestic cattle, but the offspring was wild, unruly, and impatient of restraint. Specimens of the Bison have been placed in the Zoological Gardens of London, and the Garden of Plants at Paris.

Subgenus BUFFALO: *Bubalus.*—Of this there are several species, distinguished by having harsh, thick hair, almost entirely black, and a forehead rounded and swelling out between the horns, which are more or less flattened, the bases being enlarged and approaching each other.

The Common Buffalo, *B. Buffalus—Bos bubalis* of Linnæus—had its origin in India, where it is extensively distributed. There are two varieties—the tame, called *Bhainsa*, and the wild, called *Arna*, or *Arnee*. The tame one is trained to domestic uses, especially for draught, and is commonly employed for this purpose. Its milk is little used, and its flesh is rank. It is suited, however, to marshy districts, and on this account has not only been used for centuries in parts of India, but has been distributed over some of the Asiatic islands and portions of Europe, and especially in Italy and the Crimea. It thrives in those regions affected by the malaria, and hence has become common in the Roman States as well as in Naples, and the traveler on the Pontine Marshes may see large herds of them feeding and fattening in an atmosphere which is not only deadly to man but poisonous to many brutes. Its color is nearly black, its head is carried low, and its aspect is wild, shy, and sinister. Its temper, however, is tolerably calm, and it works at the plow and cart with docility and energy; it is also sometimes used as a beast of burden, and particularly in countries where the roads are of a muddy and miry nature, in which its natural aptitude and great strength qualify it to move with facility.

The wild variety, or *Arna*, which is still common in Continental Asia, inhabits the margins rather than the interior of primeval forests. They never ascend the mountains, but adhere, like

the rhinoceros, to the most swampy sites of the district they inhabit. There is no animal upon which ages of domesticity have made so small an impression as upon this species, the tame being still most clearly referable to the wild ones at present frequenting all the great swampy jungles of India. The latter live in large herds, but in the season of love the most lusty males lead off and appropriate several females, with which they form small herds for the time. The wild buffalo is fully one-third larger than the largest tame breeds, the body measuring ten and a half feet in length, and six or six and a half feet high at the shoulders, and it is of such power and vigor as by his charge frequently to prostrate a well-sized elephant. It is remarkable for the shortness of the tail, which does not extend lower than the hock, for the tufts which cover the forehead and knees, and lastly, for the great size of its horns. They are uniformly in high condition, so unlike the leanness and angularity of the domestic buffalo, even at its best. With this species the period of gestation is ten months, and one or two are produced at a birth.

The strength and courage of this animal are well displayed in the following extract from Basil Hall's "Travels in India:"

"We were promised a grand day's sport one afternoon, when a buffalo and a tiger were to be pitted against each other. The buffalo entered the ring composedly enough; but after looking about him, turned to one side, and rather pettishly, as if he had felt a little bilious, overturned a vessel of water placed there expressly for his use. The tiger refused for a long time to make his appearance, and it was not till his den was filled with smoke and fire that he sprang out. The buffalo charged his enemy in a moment, and by one furious push capsized him right over. To our great disappointment, the tiger pocketed this insult in the shabbiest manner imaginable, and passing on, leaped furiously at the ropes, with which his feet became entangled, so that the buffalo was enabled to punish his antagonist about the rump most ingloriously. When at length the tiger got loose, he slunk off to a distant part of the area, lay down, and pretended to be dead. The boys, however, soon put him up again, and tried to bring him to the scratch with squibs and crackers, and a couple of dozen dogs being introduced at the same moment, they all set at him, but only one ventured to take any liberty with the enraged animal. This bold dog actually caught the tiger by the tail, but a slight pat of the mighty monster's paw crushed the yelping cur as flat as a board. The buffalo, who really appeared anxious to have a fair stand up fight, now drove the dogs off, and repeatedly poked the tiger with his nose, and even turned him half over several times with his horns.

"We had then a fight between two buffaloes, which ran their heads against each other with a crash that one could fancy shook the palace to its very foundation; indeed, the only wonder was how both animals did not fall down dead with their skulls fractured. But there appears to be a wonderful degree of thickness or hardness in this part of the animal."

The African Buffalo, so called in distinction from the preceding, which is called the *Indian Buffalo*, is the *B. Cafer* of naturalists, and is often called the *Cape Buffalo*, it having been formerly very common at the Cape. It is of the size of the largest ox, is of a rough, shaggy, wild appearance, and in a state of nature is altogether a savage and formidable brute. It is specially distinguished by its enormous horns, which are of a more solid and compact texture than those of any other species of *Bos*, resembling, in fact, the substance of the horns of the antelope; the bases of these, which extend in two large protuberances nearly across the forehead, form a powerful battery, by which the animal breaks and dashes through the thick branches of the forest. They live in large herds, and though they generally fly from man, when wounded become exceedingly dangerous. Sometimes, also, they will make sudden and fierce attacks upon hunters and travelers whom they chance to meet in their haunts. All the genus have a dislike to red colors, and when one of these creatures is excited in this way, it attacks the offensive object with great ferocity.

This species delight in wallowing in the mire, and when heated, throw themselves into the water. Their hair, consisting mostly of a mane and beard, and patches on parts of the body, is rough and shaggy, and is nearly black; the skin of the hinder parts is almost naked; the horns are four to five feet long, and the tips sometimes five feet apart. The hide is exceedingly thick and tough, and resembles that of the rhinoceros; it is much sought after for harnesses.



THE AFRICAN BUFFALO.

Considerable numbers of these animals exist in a wild state in Eastern Africa, extending from the Cape to Abyssinia. It appears, also, from the recent accounts of Cummings, Anderson, Livingstone, and others, that they are common in all Southern Africa. The following account is furnished by the first of these writers; the adventures referred to took place nearly in the center of Southern Africa—about latitude 24° south and longitude 25° east—some eight or nine hundred miles northeast of Cape Town:

"We took up the spoor of a troop of buffaloes, which we followed along a path made by the heavy beasts of the forest through a neck in the hills, and emerging from the thicket, we beheld, on the other side of a valley which had opened upon us, a herd of about ten huge bull buffaloes. These I attempted to stalk, but was defeated by a large herd of zebras, which, getting our wind, charged past and started the buffaloes. I ordered the Bechuanas to release the dogs, and spurring Colesberg, I gave chase. The buffaloes crossed the valley in front of me, and made for a succession of dense thickets in the hills to the northward. As they crossed the valley, by riding hard I obtained a broadside shot at the last bull, and fired both barrels into him. He, however, continued his course, but I presently separated him, along with two other bulls, from the troop. My rifle being a two-grooved, which is hard to load, I was unable to do so on horseback, and followed with it empty, in the hope of bringing them to bay. In passing through a grove of thorny trees I lost sight of the wounded buffalo; he had turned short and doubled back, a common practice with them when wounded.

"After following the other two at a hard gallop for about two miles, I was riding within five yards of their huge broad sterns. They exhaled a strong bovine smell, which came hot in my face. I expected every minute that they would come to bay, and give me time to load; but this they did not seem disposed to do. At length, finding I had the speed of them, I increased my pace, and going ahead, I placed myself right before the finest bull, thus expecting to force him to stand at bay, upon which he instantly charged me with a loud roar, very similar to the voice of a lion. Colesberg neatly avoided the charge, and the bull resumed his northward course. We now entered on rocky ground, and the forest became more dense as we proceeded. The buffaloes were evidently making for some strong retreat. I, however, managed with much difficulty to hold them in view, following as best I could through thorny thickets. Isaac rode some hundred yards behind, and kept shouting to me to drop the pursuit, or I should be killed. At last the buffaloes suddenly pulled up, and stood at bay in a thicket within twenty yards of me. Springing from my horse, I hastily loaded my two-grooved rifle, which I had scarcely completed when

Isaac rode up and inquired what had become of the buffaloes, little dreaming that they were standing within twenty yards of him. I answered by pointing my musket across his horse's nose and letting fly sharp right and left at the two buffaloes.

"A headlong charge, accompanied by a muffled roar, was the result. In an instant I was round a clump of tangled thorn-trees; but Isaac, by the violence of his efforts to get his horse in motion, lost his balance, and at the same instant, his girths giving way, himself, his saddle, and big Dutch rifle, all came to the ground together, with a heavy crash, right in the path of the infuriated buffaloes. Two of the dogs, which had fortunately that moment joined us, met them in their charge, and by diverting their attention, probably saved Isaac from instant destruction. The buffaloes now took up another position in an adjoining thicket. They were both badly wounded, blotches and pools of blood marking the ground where they had stood. The dogs rendered me assistance by taking up their attention, and in a few minutes these two noble bulls breathed their last beneath the shade of a mimosa grove. Each of them, in dying, repeatedly uttered a very striking, low, deep moan. This I subsequently ascertained the buffalo invariably utters when in the act of expiring.

"On going up to them, I was astonished to behold their size and powerful appearance. Their horns reminded me of the rugged trunk of an oak-tree. Each horn was upward of a foot in breadth at the base, and together they effectually protected the skull with a massive and impenetrable shield. The horns, descending and spreading out horizontally, completely overshadowed the animal's eyes, imparting to him a look the most ferocious and sinister that can be imagined. Early in the afternoon I dispatched men with a pack-horse to bring the finer of the two buffalo-heads. It was so ponderous that two powerful men could with difficulty raise it from the ground. Isaac did not soon forget his adventure with the buffaloes, and at night, over the fire, he informed my men that I was mad, and that any man who followed me was going headlong to his own destruction."

Another passage, furnished by the same adventurous sportsman, is too descriptive to be omitted:

"We were marching quietly along, and were nearly opposite the center of the reeds, when, on emerging from a grove of thorny mokala-trees, casting our eyes to the right, we suddenly beheld a numerous herd of buffaloes grazing on the open plain between us and the vley. Their dark imposing squadrons extended over a great space of ground, and we reckoned that there might have been between six and eight hundred of them. I immediately saddled 'Sunday,' and rode toward them. As I drew near, they stood gazing at me for a minute, and then, panic-stricken, the whole herd started off together, making for the nearest wood. Pressing my horse, I was soon ahead of them, and by shouting I turned them right about, when they thundered along in a compressed mass, and held for the reeds. Their amazing numbers greatly impeded their progress, and I had no difficulty in keeping alongside of them. I kept on their right flank to enable me more conveniently to fire, and on one occasion, on my riding very near the foremost of the herd, a large division of those behind me suddenly extended to the right and increased their pace, and on looking over my shoulder, I found myself almost surrounded by their helmeted squadrons.

"As I galloped along I endeavored to select the finest head, but among so many it was no easy matter to make a choice, and as soon as I selected one he disappeared among the ranks of his companions. At length, riding at the gallop, I let fly right and left into the herd, and next moment they had gained the margin of the lofty reeds. Here the whole herd suddenly halted and faced about with the regularity and precision of a regiment of cavalry, when, having overhauled me for half a minute, they charged headlong into the soft, muddy vley, and in another moment they were hidden from my view. I marked the reeds bowing before them far on my right and left as they splashed and struggled through the marshy vley, and presently they gained the other side, when, emerging from the reeds, they held across the open plain, steering for their strongholds in the woods beyond. As the clouds of dust behind me cleared away, I looked back and beheld a fine old cow stagger for a moment and then fall dead, and near her stood a wounded calf, whose mother had remained beside it, being loth to leave her offspring."

Dr. Livingstone gives a similar account of the abundance of wild buffaloes in these regions, and adds some striking illustrations of their enormous strength. Among these is the following, the



THREE LIONS ATTACKING A WOUNDED BUFFALO.

account having been furnished by a friend: "Oswell and I were riding—15th September, 1846—along the banks of the Limpopo, when a water-buck started in front of us. I dismounted, and was following it through the jungle, when three buffaloes got up, and after going a little distance, stood still, and the nearest bull turned round and looked at me. A ball from the two-ouncer crashed into his shoulder, and they all three made off. Oswell and I followed as soon as I had reloaded, and when we were in sight of the buffalo, and gaining on him at every stride, three lions leaped on the unfortunate brute; he bellowed most lustily as he kept up a kind of running fight, but he was, of course, soon overpowered and pulled down. We had a fine view of the struggle, and saw the lions on their hind-legs tearing away with teeth and claws in most ferocious style. We crept up within thirty yards, and kneeling down, blazed away at the lions. My rifle was a single barrel, and I had no spare gun. One lion fell dead almost *on* the buffalo; he had merely time to turn toward us, seize a bush with his teeth, and drop dead with the stick in his jaws. The second made off immediately, and the third raised his head, coolly looked round for a moment, then went on tearing and biting at the carcass as hard as ever. We retired a short distance to load, then again advanced and fired. The lion made off, but a ball that he received *ought* to have stopped him, as it went clean through his shoulder-blade. He was followed up and killed after having charged several times. Both lions were males. It is not often that one *bags* a brace of lions and a bull buffalo in about ten minutes."

Beside this formidable species, Africa contains another, called by the negroes of Bornou, where it is common, the Zamouse; by the English of Sierra Leone, Bush Cow; by naturalists, *B. brachyceras*. It differs essentially from all other species, the forehead being flat, the horns short, thick, and depressed at the base; ears large, and slightly fringed at the edge; the hair close, short, and of a reddish-brown color. It is also entirely destitute of dewlap. This kind of buffalo seems to live in considerable herds in the forests of Central and Western Africa, and though less ferocious than the *B. Cafer*, is still a large, wild, and powerful species.

Subgenus OVIBOS: *Ovibos*.—Of this there is a single species, the Musk Ox, *O. Moschatus*, of



THE MUSK OX.

the polar regions of North America; the *Mateeh Moostoos*, or *Ugly Bison* of the Cree Indians. The Barren Lands, lying to the north of the sixtieth parallel, are their chief haunts. They frequent rocky regions destitute of woods, living on grass in the mild season and on lichens in winter. They are about one third the size of the common ox, one of them weighing from three to four hundred pounds. The horns are broad at the base, and meet and cover the brow and crown of the head. The general color of the hair is brown; this is long, matted, and curled on the neck and between the shoulders, where it is rather grizzled; on the back and hips it is long but lies smoothly; on the shoulders, sides, and thighs it is so long as to hang down below the middle of the leg. There is on the center of the back a mark of soiled brownish-white, called by Captain Parry *the saddle*. On the throat and chest the hair is very straight and long, and together with the long hair on the lower jaw, hangs down like a beard and dewlap. The short tail is concealed by the fur of the hips. There is a large quantity of fine brownish ash-colored wool or down among the hair covering the body. The hair on the legs is short, and of a dull brownish-white, unmixed with wool. The hoofs are longer than those of the caribou, but so similar in form that it requires the eye of a practiced hunter to distinguish the impressions. In the cow, which is smaller than the bull, the horns are smaller, and their bases, instead of touching, are separated by a hairy space. The legs are short, but the animal runs fast, and easily scales the rocky ledges which are nearly impassable to horses. They live in herds of twenty to thirty, and bring forth in May or June. Many of the bulls are killed in furious conflicts with each other. The flesh is, in general, highly relished, but the animals have a strong musky flavor, which renders their meat, when lean, strong and unsavory.

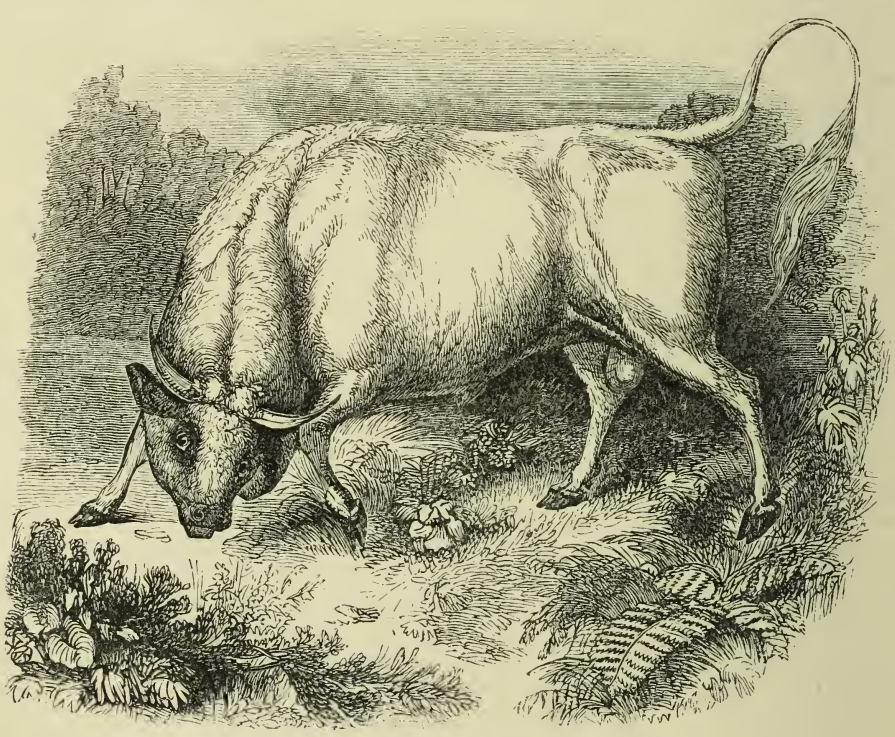
These creatures are much hunted by the Esquimaux and other Indians. Richardson says, "If the hunters keep themselves concealed when they fire upon a herd, the poor animals mistake the noise for thunder, and, forming themselves into a group, crowd nearer and nearer together as their companions fall around them; but should they discover their enemies by sight, or by their sense of smell, which is very acute, the whole herd seek for safety by instant flight. The bulls, however, are very irascible, particularly when wounded, and will often attack the hunter, and endanger his life unless he possesses both activity and presence of mind. The Esquimaux, who are well

accustomed to the pursuit of this animal, sometimes turn its irritable disposition to good account; for an expert hunter having provoked a bull to attack him, wheels round it more quickly than it can turn, and by repeated stabs in the belly puts an end to its life."

We may here state that an animal called Takin, *Budorcas taxicola*, is found in the Himalaya mountains, and is placed among the *Bovina* by Dr. J. E. Gray. The hair is harsh and short; the tail hairy like that of the goat; the head large and heavy; the limbs short and straight; the hoofs broad. Its habits are, however, little known, and its position is not defined.

Subgenus TAURUS.—Of this there is one species, the Domestic Ox; the *Bos domesticus* and *Bos taurus* of Linnæus; *Bœuf* of the French; *Stier* and *Ochs* of the Germans—the most useful of all animals to man. Of its origin we have no record, and in attempting to discover its parent stock, we have even greater difficulties than those which beset us in tracing the parentage of other domestic animals; for beside the various existing breeds of domestic cattle, there are several species of bovine animals which we have just described, analogous to them, and all of which, whether aurochs, bison, buffalo, yak, or musk-ox, will breed with them, and the offspring of all are more or less prolific.

There is in these facts a wide range for discussion and dispute. Some have traced all the varieties of the modern ox—at least all the European varieties—to the aurochs, and that view has passed into a common opinion. Another idea has been that the *Urus*, spoken of by Cæsar as inhabiting the Hyrcanian forests at the time of his invasion of Gaul—some half a century before the Christian era—was the true parent of our domestic cattle. As described by the great Roman



THE CHILLINGHAM BULL.

general this animal was of prodigious size and strength—at least one-third larger than our largest oxen, and at the same time of a fierce and formidable nature. It has ceased to exist in a wild state, but fossil bones are found abundantly in various parts of Europe, supposed to have belonged to this species, and to which geologists give the name of *Bos primigenius*. One thing further is maintained, which is, that the existing *Scottish* or *Chillingham breed of Cattle* are the true representatives of this formidable Urus: and as they are also manifestly allied to our domestic varieties,

some have supposed that the line of descent, from the former to the latter, is thus logically established.

To this view several serious difficulties are offered. In the first place, though the fossil bones alluded to—those of the *Bos primigenius*—may probably be those of Cæsar's Urus, there is no historical evidence to show any connection between this species and the Scottish or Chillingham breeds, and which, by the way, are called by naturalists *Bos Scoticus*. The only grounds for alleging the descent of one from the other, is that the latter are said to be of a wild and untamable character, and hence to be in their nature and disposition like the former. It appears, however, that on this point there has been much exaggeration. The only remains of these breeds are a few small herds in the park of the Duke of Hamilton, in Scotland, and in that of Lord Tankerville, at Chillingham, in Northumberland. These, we are told, are invariably white, fly wildly from the approach of man, though wheeling round after a time and tossing their heads in a menacing manner; hide their calves in remote and solitary retreats; they possess a mane, a square, concave forehead, a throat and breast covered with coarse hair, &c., &c. This exciting portrait is, however, a good deal subdued by the statements of a recent and careful observer, Mr. Vasey, who says in his work on the ox tribe, that "the animals in question do not exhibit more wildness than most domesticated animals when allowed to roam without restraint; and that their young, when properly reared, are as docile as those of the ordinary domestic cattle. Nor do they possess a mane, as has been frequently asserted. These wild cattle breed with the domestic cattle. The cow goes the same period with young. They have the same number of ribs, and even their white color at Chillingham is the result of the destruction, by order of the owner, of all spotted calves that are produced."

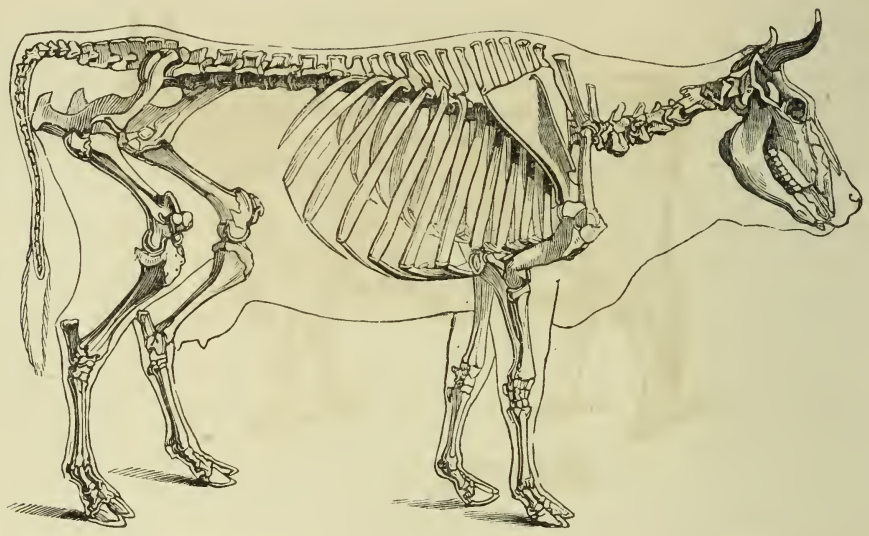
We deem it safe, therefore, to conclude that the Urus of Cæsar has wholly disappeared from the earth as a living species; that the Aurochs is a true Bison, and cannot have been the parent of our modern domestic Ox. Nor can we rationally trace this to any species of buffalo, nor indeed, to any other wild animal now known. It is possible and probable, that among the various fossil relics of bovine animals found in Europe, those of the true progenitors of our modern cattle may exist; but after all, we must come back to the historical fact that in the very earliest records of our race, the ox is found to be existing in a domestic state. Jubal, the son of Lamech, probably born in the lifetime of Adam, is spoken of in the Bible as "the father of such as have cattle;" cattle were among the animals that entered the ark with Noah; cattle were woven into the religious and domestic institutions of the ancient Egyptians, and hence appear inscribed on the oldest of their monuments. The Greeks and Romans used cattle for sacrifice, as well as for the same uses to which we devote them; the ox and cow figure among the remotest records of India. The traditions of every Celtic nation enroll the cow among the earliest productions of civilization. The Island of Great Britain was so stocked with cattle in the time of Cæsar, that milk constituted a large part of the food of the inhabitants.

The ox, then—the domestic ox—is as old as civilized man; if man began his career as a civilized being, the ox, already tamed and suited to his use, was doubtless given him; if man was at first a savage, we may conclude that the ox, in the beginning, was also a wild animal. But at present, no living race, wild or tame, can claim, with any degree of confidence, to be the exact type of that primeval species. As the horse and dog have lost their father, so has the ox; all we can say of him, therefore, is, that his name was Bull: not *Bull Urus*, and not *Bull Aurochs*, and not *Bull Buffalo*, but *Bull Taurus*, such as we have all often seen—a powerful animal, with a curly pate, giant frame, and a loud, bellowing voice, challenging all other bulls to combat.

From these speculations—which, after all, are very enticing to the imagination—we might turn to another question, that of the origin of the numerous breeds of domestic cattle. They are quite as diversified in color, form, temper, and other physical and moral qualities as the nations and tribes of men. What a wilderness of breeds between short-horns, long-horns, middling-horns, and no horns at all; between white and black, pied and brindled!* But as this subject is not

* Dr. Gray gives upward of forty synonyms for this species—the Common Ox. It is the *Bos Taurus* of Pliny; *Taurus castratus* of Johnston; *Vacca* of Gesner; *Bos domesticus* and *Bos taurus* of Linnæus; the *Bull*, *Ox*, and *Common Ox* of Pennant and Shaw; the *Stier* and *Ochs* of German writers, and *Bœuf* of the French; it is the *White Scotch*

less involved in obscurity than that of the origin of varieties in the human race, we shall pass it by, giving to it only such incidental notices as the description of particular kinds of cattle may suggest.



SKELETON OF A COW.

We now proceed to describe the domestic species *Bos taurus*. Of the structure of this we need not give any elaborate description; the engraving which we present will be all that is required in this respect. The male of the species, the Bull, is a powerful brute, conscious of his strength, and easily excited to a display of his rage. His pugnacity caused him formerly to be used for the public sport of bull-baiting in England and other European countries; in Spain, bull-fights are still the most relished of all the popular national spectacles. The Ox, sometimes called Bullock, is used for the plow and the cart or wagon, and sometimes also to carry burdens. Of all creatures, it seems to be the meekest, mildest, and most patient. The Cow is gentle and faithful, and alike the generous nurse of children and men. The various ways in which these creatures are useful to mankind are almost innumerable. Every part of the Ox is of value.* We eat his flesh,

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Bull, the *Bisontes jubati* of Boethius; the *White Urus* of Colonel H. Smith; the *Chillingham Bull* of Gray; the *Wild* or *White Forest-Cow* and *Bull* of Low; the *Wild Cattle* of Bewick. Varieties of this species are known to the grazier by a large number of names; some of these are generally recognized, and have characteristic types, as the *Pembroke Bull*, the *West Highland Bull*, the *Zetland Cow*, the *Kerry Cow*, the *Alderney Cow*, the *Fifeshire Cow*, *Long-horned* or *Lancashire Bull*, the *English Short-horn Cattle*, the *Short-horn Ox*, the *Polled Suffolk Cow*, the *Sussex Ox*, the *Yorkshire Cow*. Among those recognized of foreign rearing we may mention the *Holstein* or *Dutch Bull*, the *Polish Bull*, the *Hungarian Bull*, the *South African Long-horned Cattle*, *Swiss Cattle*, *Alpine Cattle*, the *Syrian Ox*, *Moldavian Cattle*, the *Italian Campagna Bull*, *Spanish Bulls*, *Egyptian Cattle*, the *Laut* of Africa—*Bos humilis* of Frisch, the *Galla Ox*—*Bos Taurus Abyssinicus* of Gmelin, the *Cattle of Peauby*, the *Cattle of Brazil*, the *Cattle of Chili*, the *Nata* or *Niata* of Buenos Ayres, and the *Falkland Islands Wild Cattle.*—*English Cyclopedia of Natural History.*

* It has been calculated that the number of domestic neat cattle in Europe is as follows:

Great Britain and Ireland	8,000,000	Bavaria	2,000,000
Sweden and Norway	3,000,000	Austria	10,000,000
Russia	20,000,000	France	8,000,000
Denmark	1,700,000	Spain	2,500,000
Netherlands	2,500,000	Portugal	650,000
Prussia	4,500,000	Switzerland	800,000
Saxony	350,000	Italy	3,500,000
Hanover	800,000	Turkey	1,000,000
Wurtemberg	700,000		
Baden	400,000	Total for Europe	71,400,000

The number of domestic cattle in the United States is estimated at 22,000,000, thus exceeding the number in any European kingdom. The number for the whole world is calculated at 210,000,000. It is supposed that one-third of these are killed annually, so that we have about 70,000,000 of carcasses, weighing 28,000,000,000 pounds, 70,000,000 of skins, 140,000,000 of horns, and 280,000,000 of feet annually, to be converted into beef, tallow, leather, combs,



THE KERRY COW.

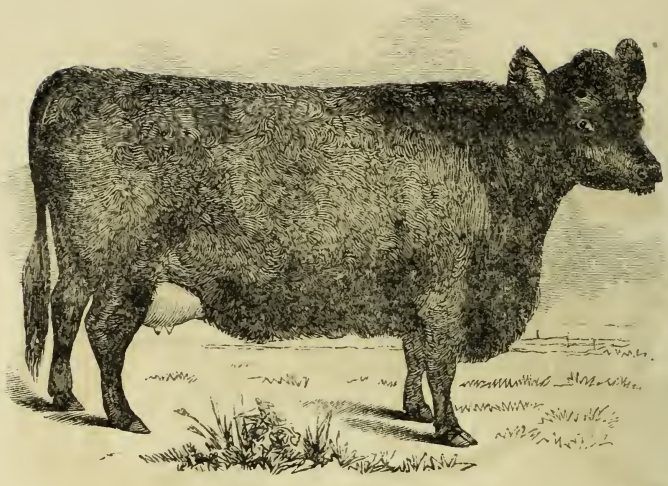
we wear shoes soled with his skin, our candles are made from his fat, our tables are joined with glue made from his hoofs, the mortar of our walls is mixed with his hair, his horns are made into combs, knife-handles, drinking-cups, &c., his bones are used in many ways instead of ivory, the fragments are ground and scattered over the fields as manure, and soup is made from his tail. The young animal, called *Calf*, is quite as useful in its way as the full-grown ox; the flesh called *veal* is by many preferred to the flesh of the ox or cow, which is called beef; jelly is made from its feet. Its stomach is salted and dried, and called *rennet*. Cheese is made by soaking a piece of this in water, and pouring it into a vessel of milk. The milk soon forms curd, which is placed in a press, and the watery substance, called whey, squeezed from it. The curd is colored and salted, and is then cheese.

The raising of cattle has ever been one of the most interesting pursuits of the agriculturist. The rich grass lands of the temperate parts of our own country, including the great natural meadows of the West, have specially invited the industry of the people in this direction. Notwithstanding the great extent of our manufactures, agriculture is still the leading pursuit, and neat cattle are one of its principal products. The kinds introduced into the country, especially in New England, by the first settlers, were those in vogue in England at the time of the emigration —somewhat over two hundred years ago—that ancient and choice breed the Devon. These to some extent, form the basis of our northeastern cattle. They have somewhat less of that symmetry and delicacy of form which mark the present race in England, but they are still a valuable and justly cherished breed. Within a few years great attention has been paid in all parts of our country to the improvement of stock, and hence the best breeds of England especially, and to some extent of other parts of Europe, have been largely introduced and mingled with our own. A brief mention of some of the most noted will be all that we can bestow on this topic.

The British cattle, being undoubtedly, by reason of long, careful and scientific breeding, the best in the world, deserve the first place. Among them we can only notice a few of the most remarkable kinds. It is proper to state, in the first place, however, that these are generally arranged in four classes: first, the *Middling Horns;* second, the *Polled* or *Hornless cattle;* third, the *Long Horns*, and fourth, the *Short Horns.*

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manure, &c., &c. The annual consumption of beef in London is estimated at about 300,000,000 pounds, which is about 100 pounds to each person—men, women, and children; in Paris the amount is 86 pounds; in Brussels 89. These calculations, though chiefly from M'Cullock, are no doubt somewhat vague and uncertain, but they will serve to convey an impression of the immense extent to which a single species of animal subserves the interests of man.



THE GALLOWAY COW.

THE MIDDLING-HORNS.

Of these the Devon Cattle claim the first place. These are a very ancient breed, of medium size, and so symmetrical as to appear small. The color is a deep mahogany red, with merely a white udder and white stripe under the body. The head is small, the muzzle delicate, the horns clear, smooth and harmoniously curved upward; the legs are peculiarly delicate. The oxen are strong and active: it is stated that one of them will easily trot six miles an hour with an empty wagon. The cow is noted for intelligence; she feeds well on scanty pastures, and her milk is rich and abundant. The flesh of this breed is excellent.

The Hereford Cattle.—These also are a very ancient breed, and some of them were brought to this country by the early settlers. They are marked by a broad forehead, and open, cheerful countenance. They are usually of a middle or dark red, though some are brown, some yellow, and some brindled; they, however, usually have white faces. They are chiefly distinguished for the excellence of their flesh, and they can be profitably brought to market at the early age of three years.

The Sussex Cattle resemble the Devons, and are supposed to have a similar origin. The color is a deep chestnut, sometimes a blood bay. As is the case with the Herefords, the cow is inferior to the ox.

The Welsh Cattle are somewhat smaller than the preceding, but three of the breeds, the *Pembroke*, the *Glamorgan*, and the *Anglesea*, are highly esteemed for their useful qualities.

Scotland contains several distinct and valuable breeds of cattle, evidently belonging to our present division, the Middling Horns.

The West Highlanders, whether we regard those that are found in the Hebrides, or the county of Argyle, seem to retain most of the aboriginal character. They have remained unchanged, or improved only by selection, for many generations; indeed, from the earliest accounts that we possess of Scottish cattle.

The North Highlanders are a smaller, coarser, and in every way inferior race, and owe the greater part of what is valuable about them to crosses from the Western breed.

The Northeastern Cattle were derived from, and bear a strong resemblance to, the West Highlanders, but are of considerably larger size.

The Ayrshire Breed are second to none as milkers.

Ireland boasts of several fine breeds, among which the Kerry Cow, called the "Poor Man's Cow" by Youatt, is a most useful variety.



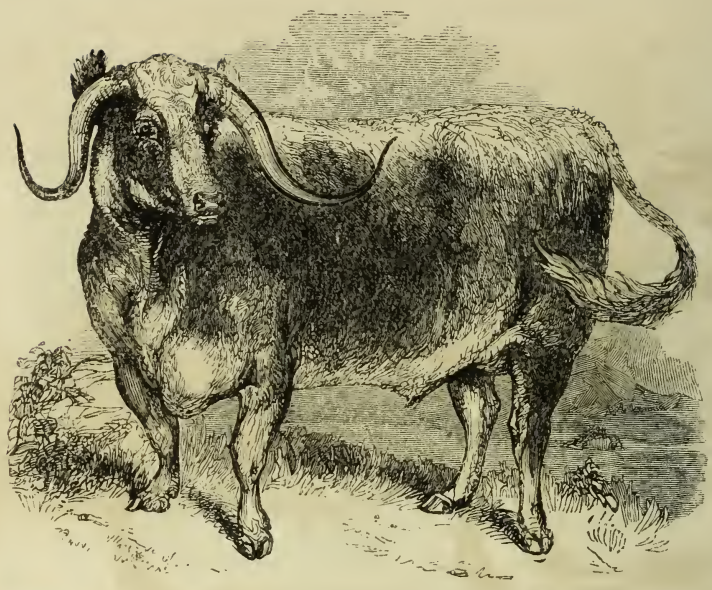
LONG-HORNED OX.

THE POLLED OR HORNLESS CATTLE.

The stewartry of Kircudbright and the shire of Wigton, with a part of Ayrshire and Dumfries, formed the ancient province of Galloway in Scotland. The two first counties possess much interest as the native district of a breed of *polled*, or *dodded*, or *humble* cattle, highly valued for its grazing properties. So late as the middle of the last century, the greater part of the Galloway cattle were horned—they were middle-horns: but some were polled—they were either remnants of the native breed, or the characteristic of the aboriginal cattle would be occasionally displayed, although many a generation had passed. For more than one hundred and fifty years the surplus cattle of Galloway had been sent far into England, and principally into the counties of Norfolk and Suffolk. The polled beasts were always favorites with the English farmers; they fattened as kindly as the others, they attained a larger size, their flesh lost none of its fineness of grain, and they exhibited no wildness and dangerous ferocity, which are sometimes serious objections to the Highland breed. Thence it happened that, in process of time, the horned Galloway breed decreased, and was at length quite superseded by the polled. These are now divided into several varieties, and being highly valued, are extensively in use.

THE LONG-HORNS.

In the district of Craven, in Yorkshire, there has been, from the earliest records of British agriculture, a peculiar and valuable breed of cattle. They were distinguished from the home breeds of other counties by a disproportionate and frequently unbecoming length of horn. In the old breed, this horn frequently projected almost horizontally on either side, but as the cattle were improved the horn assumed other directions; it hung down so that the animal could scarcely graze, or it curved so as to threaten to meet before the muzzle, and so also as to prevent the beast from grazing; or immediately under the jaw, and so to lock the lower jaw; or the points presented themselves against the bones of the nose and face, threatening to perforate them. In proportion as the breed became improved, the horns lengthened, and they are characteristically distinguished by the name of the "Long-Horns." Cattle of a similar description were found in the districts of Lancashire bordering on Craven, and also in the southeastern parts of Westmoreland; but tradition, in both of these districts pointed to Craven as the original habitation of the long-horn breed. If there gradually arose any difference between them, it was that the Craven beasts were the broadest in the chine, the shortest, the handsomest, and the quickest feeders; the



LONG-HORNED OX.

Lancashire ones were larger, longer in the quarters, but with a fall behind the shoulders, and not so level on the chine. Whence these cattle were derived was and still is a disputed point.

The long-horns seem thus to have first appeared in Craven, and gradually to have spread along the western coast, and to have occupied almost exclusively the midland counties. There are two distinct breeds: the *Smaller Cravens* inhabiting the mountains and moorlands, hardy, useful, valued by the cottager and little farmer on account of the cheapness with which they are kept, the superior quantity and excellent quality of the milk which they yield, and the aptitude with which they fatten when removed to better pasture. The *Larger Cravens*, occupying a more level and richer pasture, are fair milkers, although in proportion to their size not equal to the others; but possess a tendency to fatten and acquire extraordinary bulk, scarcely inferior to that of short-horns.

Of the various breeds of long-horns, the most celebrated are the *Leicester*, *Derby*, and *Shropshire*.

THE SHORT-HORNS.

This celebrated breed, of which there are several varieties, originally came from the continent, but in its present form it appears to have arisen in the counties of Durham and Yorkshire, where they are held to be of some antiquity, though certainly more modern than either the Devons or Herefords. They are the evident result of long and careful breeding, and have at last acquired an appearance somewhat artificial, inasmuch as many of the points are exaggerated departures from the standard British ox. The horns were originally turned upward; they have now very often a tendency downward, with their tips pointing toward each other. The head is small and finely formed; the brisket very projecting and without dewlap; the hair soft and mellow; the colors are full red and creamy white, variously mixed, and often in such a manner as to produce a brilliant effect. Black, brown, or brindled are not recognized as belonging to the pure breeds. They are very showy, and amid other cattle, give an impression of superior beauty, symmetry, and grandeur. The oxen are inferior to the Devons for work; the cows are excellent milkers. Both yield a large proportion of superior beef. The chief value of the breed, however, is the improvement they stamp, by mixture, on other breeds. On account of their importance in this respect, they have been largely introduced into the United States. In general, they are called *Durhams*, as in the county of Durham they have been supposed to attain their greatest perfection.



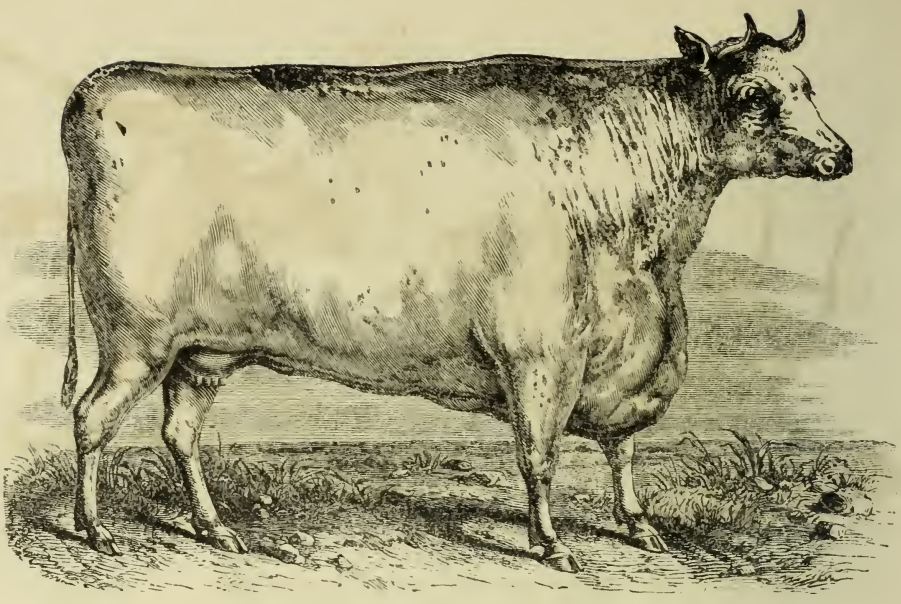
DURHAM BULL.

CONTINENTAL CATTLE.

Every nation of Europe has its particular breeds of cattle. France has several, well recognized in that country. Among them are those of *Normandy*, many of which have been imported into England, the stock being called *Alderney Cattle;* there are also in France the *Cantal breed*, the *Limousin*, the *Gascon*, the *Nivernais*, &c. The island of Camargue, formed between the two mouths of the Rhone, and which is twenty-six miles long and eleven wide, is covered with marshes, abounding not only in game, but horses and cattle of fine breeds. These live almost in a wild state. The latter are of moderate size, the horns rather short, and the color black. It is often dangerous for man to meet with them; the cows are as fierce as the bulls; they hide themselves with the greatest care from the observation of man. The inhabitants of Marseilles and other towns of France employ the bulls for bull-fights.

Holland, Belgium, Denmark, Poland, Hungary, Greece, Spain, Italy, and Russia, have their several breeds of cattle, each distinguished by particular qualities. In several of these countries there are herds which have been permitted to breed in the forests and marshes without the intervention of man, and which are, accordingly, almost as wild and savage as the original tenants of the woods. In the extensive forests of Spain and Portugal cattle of this kind are numerous; they fly from man unless attacked, in which case they turn upon their enemy and make a furious charge, which not unfrequently proves fatal. The bulls of these herds are driven into inclosures by large parties of horsemen skilled in this species of hunt; they are then taken to the amphitheaters, where they are employed for the bull-fights. The bulls of particular districts have a high reputation for fierceness, and when one of them is announced at the spectacle, like a "Star" at a theater, he draws a large and excited circle of spectators.

In Italy there are similar breeds of wild cattle, especially in the Maremma. This is a flat strip of land, extending on the western side of Italy, from Genoa to Calabria, a distance of six hundred miles, except only that it is interrupted in a few places by hills. It reaches from the shores of the Mediterranean to the lower bases of the Apennines, and is from two to twenty miles in width. The land is fertile in the extreme, but over the whole a pestilental vapor prevails in summer, which makes it unfit for the abode of man. A few patches only are cultivated · the rest is



DURHAM COW.

covered with rich pastures or luxuriant thickets. It thus becomes a paradise for various species of game, and also for swine, buffaloes, and cattle. Here, beside the animals used for work on the farms, large herds roam unmolested, but under the care of keepers, which, together with the buffalo keepers and forest-rangers, are the only stationary population in the wild Maremma. These men, who are often criminals fled from justice, are as wild and dangerous as the brutes under their charge; they are mounted on fast horses and armed with a long lance, which they use in driving the cattle or defending themselves from the bulls, which are often fierce and dangerous. The cattle are collected at various times and driven by these men to the fairs held in the towns, for sale. The bulls are often used for bull-fights.

The prevailing breed of cattle in Italy is of large size, with tall horns, and dewlaps that sweep the ground. Some of the bulls produced in the Campagna—the circular space of open country around the city of Rome—are splendid specimens. In Tuscany the cattle are of a mouse color, with blue eyes, and are a beautiful, docile, and useful breed.

In Southern Russia vast herds of cattle are reared which are taken to St. Petersburg. These animals are generally white, and weigh about seven hundred pounds. They are driven by men who travel in wagons drawn by oxen, and are three months on their journey.

The pastoral economy of Switzerland, which is common to Savoy and other Alpine countries, and the annual progress of the shepherds and cowherds, with their flocks of cattle, to and from the mountains, are exceedingly interesting. We have not, however, space to describe these scenes; nor is it necessary, for they have often been delineated by the pens of admiring travelers.

In Wallachia and Moldavia cattle are abundant; in the latter district, indeed, the people continue in a great measure their ancient nomadic habits, making use of the services of the ox as a beast of draught or burden: united in large caravans, they roam over an immense extent of territory, transporting, in tall vehicles of singular construction, various articles of produce, provisions, and other things, to the towns scattered at wide distances about the vast plains of Moldavia. Day by day they move cheerfully on, to the slow and measured sound of the footsteps of their oxen, and are often an entire month without seeing a single human habitation. At the approach of evening the caravan halts, the numerous wagons are disposed in the form of a square, and the oxen are turned out to graze at large, under the watchful care of intrepid dogs who accompany the caravan. In the middle of the square a fire is now lighted, at which the conductor prepares his simple repast, and afterward disposes himself for sleep, sheltered by a warm and



DRIVING WILD CATTLE OF THE MAREMMA.

heavy coverlet that completely enwraps him. These indefatigable walkers are no less excellent riders: they possess a fine race of horses, which are employed for drawing lighter vehicles, while the heavier wagons are drawn by the slow oxen. There are no high-roads in Moldavia; the plain is open, and each traveler chooses his own track, and it is often with difficulty that the oxen can drag their way through heavy ground: storms of wind, rain, or snow make the matter worse, so that a passage can only be achieved by great patience, labor, and resolution.

OTHER VARIETIES OF CATTLE.

Africa has several breeds of domestic cattle; those of Senegal are not larger than a common yearling calf; Abyssinia has a breed called *Galla*, the horns of which are very tall and lyre-shaped. Animals of this breed are used at the Cape of Good Hope, and are called the *Cape Ox*. When the Dutch took possession of the Cape of Good Hope and the adjacent country, about two centuries ago, they found the Hottentots a pastoral people, and possessed of large flocks and herds. The cattle are of the breed we have been describing. They are not only trained for draught and riding, but certain tribes employ them in war. Kolben describes them as follows: "Every army is provided with a large troop of these war-oxen, which are called *Bake-leys;* they permit themselves to be governed without trouble, and their leader lets them loose at the appointed moment. The instant they are set free they throw themselves with impetuosity on the opposing army; they strike with their horns, they kick with their heels, they overthrow, they rip up and trample beneath their feet, with frightful ferocity, all that oppose them; they plunge with fury into the midst of the ranks, and thus prepare for their masters an easy victory. The manner in which these oxen are trained and disciplined certainly does great honor to the talent of these people." Levaillant, who visited the country in 1791, confirms this statement. At the present day the Hottentots are a mere fragment of the ancient tribe.

The Caffers, Corannas, and other tribes, have oxen in abundance, which are employed as beasts of burden. The Corannas are a nomadic race, frequently removing with their flocks and herds to fresh pasture land; and transporting their mats, tents, and utensils strapped on the back of oxen, which also carry themselves and their wives and children.

"Fast by his wild resounding river
The listless Coran lingers ever;
Still drives his heifers forth to feed,
Soothed by his gorrah's humming reed;



INDIAN OX OR ZEBU OF THE LARGER KIND.

A rover still unchecked will range,
As humor calls or seasons change,
His tent of mats and leathern gear
All packed upon the patient steer."

The oxen of Southern Africa are chiefly used for traveling over the interior of the country. They are harnessed to large covered wagons, in which men, women, and children make journeys of hundreds of miles; and as there are often no towns or houses along the way, these vehicles are not only used to ride in, but to sleep in. While the party is encamped at night they often hear the roar of the lions and howls of the hyenas around them. Many European travelers have given us narratives of expeditions of this kind.

In other parts of Africa the ox is employed in like manner. Major Denham gives the following account of its use in a portion of Central Africa which he visited: "The beasts of burden," he observes, "are the bullock and the ass. A very fine breed of the latter are found in the Mandara valleys. Strangers and chiefs in the service of the sheikh, or sultan, alone possess camels. The bullock is the bearer of all the grain and other articles to and from the markets. A small saddle of plaited rushes is laid on him, when sacks made of goat-skins, and filled with corn, are lashed on his broad and able back. A leathern thong is passed through the cartilage of his nose, and serves as a bridle; while on the top of the load is mounted the owner, his wife, or his slave. Sometimes the daughter or wife of a rich Shouaa will be mounted on her particular bullock, and precede the loaded animals, extravagantly adorned with amber, silver rings, coral, and all sorts of finery; her hair streaming with fat; a black rim of kohal, at least an inch wide, round each of her eyes; and, I may say, arrayed for conquest at the crowded market. Carpet or ropes are then spread on her clumsy palfry; she sits astride, and with considerable grace guides her animal by the nose."

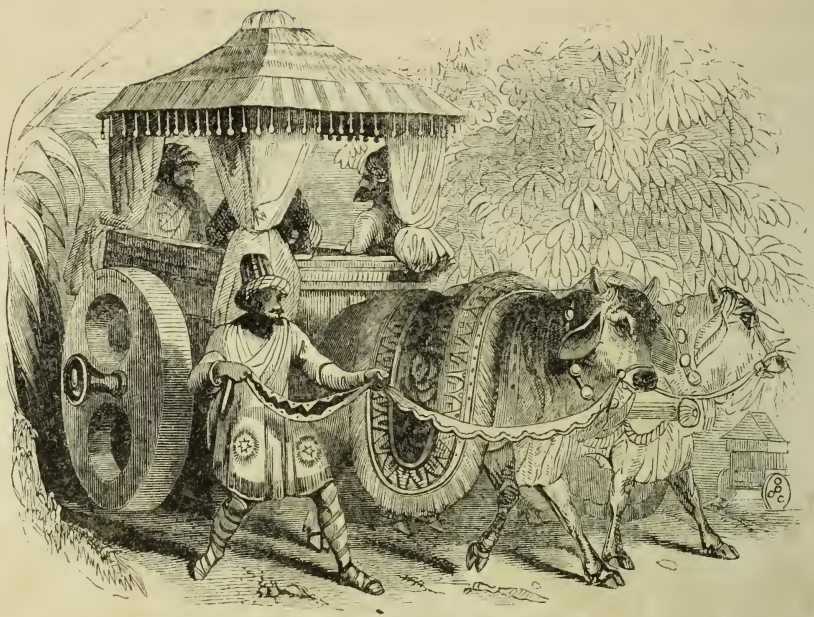
The ox of the ancient Egyptians, as may be seen by the figures of their god Apis, was similar to the present European breeds.

The wild cattle which exist in immense herds on the plains of South America, and in Mexico and Texas, are the offspring of animals carried thither by the Spaniards some two or three centuries ago. For this space of time they have lived in a state of complete independence of man, and as they preserve a close resemblance to the common cattle of Europe and America, it is justly and strongly argued that these must be of an original and distinct, because self-perpetuating, species.



INDIAN COW OR ZEBU OF THE SMALLER KIND.

The Indian Ox or Zebu, *Bos Indicus*, is only known in a domestic state. In many respects its conformation is peculiar; it has a long head, short, blunt horns, drooping ears, and a hump on its shoulders sometimes weighing fifty pounds. Its temper is gentle, and in its qualities it resembles the common ox. It is supposed by many naturalists, and among others, by Bennett, to be a mere variety of our common cattle, his chief reason being that it readily breeds with them and its peculiarities rapidly disappear by the mixture. It has been lately shown, however, that the number of vertebræ and period of gestation both differ from those of our cattle; and hence the opinion now prevails that the zebu is of a distinct species. Numerous breeds of them, varying in size from that of a large mastiff-dog to that of a full-grown buffalo, are spread, more or less extensively, over the whole of Southern Asia, the islands of the Indian Archipelago, and the eastern coast of Africa from Abyssinia to the Cape of Good Hope. In all these countries the zebu supplies, to a greater or less extent, the place of the ox, both as a beast of draught and burden and as an article of food and domestic economy. In some parts of India it executes the duties of the horse, being either saddled and ridden, or harnessed in a carriage, and performing in this manner journeys of considerable length with tolerable celerity. Some of the older writers speak of fifty or sixty miles a day as its usual rate of traveling; but the more moderate computation of recent authors does not exceed from twenty to thirty. Its beef is considered by no means despicable, although far from equaling that of the European ox. The hump, which is chiefly composed of fat, is reckoned the most delicate part. As might naturally be expected from its perfect domestication and wide diffusion, the zebu is subject to as great a variety of colors as those of the European race. Its most common hue is a light ashy gray, passing into a cream-color or milk-white; but it is not unfrequently marked with various shades of red or brown, and occasionally it becomes perfectly black. Its hump is sometimes elevated in a remarkable degree, and usually retains its upright position; but sometimes it becomes half pendulous and hangs partly over toward one side. Instances are cited in which, as we have stated, it had attained the enormous weight of fifty pounds. A distinct breed is spoken of as common in Surat, which is furnished with a second hump. Among the other breeds there are some which are entirely



EAST INDIAN CARRIAGE DRAWN BY ZEBUS.

destitute of horns, and others which have only the semblance of them, the external covering being unsupported by bony processes, and being consequently flexible and pendulous.

The zebus bear a charmed life among the weak and superstitious Hindoos, who venerate them and hold their slaughter to be a sin, though they do not object to working them. There are, however, some particularly sanctified zebus, who lead an easy life, wandering about the villages, and even the cities, as they list, and taking their pleasure and their food where they like, if not prevented by the contributions of the devout. They may be seen every day wandering at large in the streets of Calcutta, eating rice, grain, and flour in the bazaar; and the utmost a native does when he sees them honoring his goods too much, is to urge them, by the gentlest hints, to taste some of the good things on his neighbor's stall.

Bayard Taylor tells us that "the narrow streets of the city of Benares are obstructed, in the vicinity of the temple, with numbers of these sacred bulls. The place swarms with them, and they are as great a nuisance to it as the mendicant friars are to Rome. They are knowing bulls, perfectly conscious of their sacred character, and presume upon it to commit all sorts of depredations. They are the terror of the dealers in fruits and vegetables, for although not always exempted from blows, no one can stand before their horns, and these they do not scruple to use, if necessary, to secure their end. Sometimes, on their foraging expeditions, they boldly enter the houses, march up stairs, and take a stroll on the flat roofs, where they may be seen looking down with a quiet interest on the passing crowds below. From these eminences they take a survey of the surrounding country, calculate its resources, and having selected one of the richest spots within their circle of vision, descend straightway, and set off in a bee-line for the place, which they never fail to find.

"When the fields look promising on the other side of the Ganges, they march down to the river banks and prevent any passenger from going on board the ferry-boats until they are permitted to enter. They cross and remain there until the supplies are exhausted, when they force a passage back in the same manner. The gardens of the English residents frequently suffer from their depredations, and the only effectual way of guarding against them is to yoke them at once, and keep them at hard labor for a day or two, which so utterly disgusts them with the place that they never return to it. It is also affirmed that they carefully avoid the neighborhood of those butchers who supply the tables of the English, having observed that some of their brethren disappeared in a miraculous manner, after frequenting such localities."

The Dante, *Bos Dante*, sometimes called the *Egyptian Zebu*, is probably a variety of the preceding.

The Syrian Ox of the present day has wide-spreading horns, high shoulders, and a dewlap that nearly sweeps the ground. This is of the same species as our domestic ox; it is also, no doubt, the ox of the Bible, though some learned men hold that this animal was the Indian buffalo, which has been domesticated for ages in the East, and which is still used in Syria, Egypt, and other Bible countries, as well as in the various parts of India and Europe, already mentioned.



ITALIAN FARMERS REJOICING AFTER THE HARVEST.*

GENERAL REMARKS ON DOMESTIC CATTLE.

We need not enlarge upon the fact already stated, that our domestic cattle probably contribute more largely to the solid comfort of society at large than any other species of animal; nor need we repeat the eulogies we have pronounced upon that favorite member of the ox family, the Cow. But as there are great differences of quality in this creature, we copy for the advantage of all our readers the following quaint recipe by which a good one may always be known:

She's long in her face, she's fine in her horn;
She'll quickly get fat without cake or corn;
She's clear in her jaws and full in her chine,
She's heavy in flank and wide in her loin.

She's broad in her ribs and long in her rump,
With a straight, flat back and never a hump;
She's wide in her hips and calm in her eyes,
She's fine in her shoulders and thin in her thighs.

She's light in her neck and small in her tail,
She's wide in her breast and good at the pail;
She's fine in her bone and silky of skin,
She's a grazier's without and a butcher's within.

* In the engraving above, the wild, sinister aspect of the buffalo, even in its domestic state, is well represented.

The points of a good ox may be thus stated: the head should be long, the muzzle fine; the countenance calm and quiet; the horns fine; the neck light; the breast wide; the shoulders moderately broad; the fore flank well filled up; the girth, behind the shoulders, deep; the back straight, wide, and flat; the ribs broad; the belly well kept in, and not sinking low; the hind-quarters—that is, from the hips to the extremity of the rump—long and straight; the legs straight, clean, and fine-boned, and when the animal is in high condition, the skin is of a rich and silky appearance.

The natural duration of life with the Ox and Cow* is upward of twenty years; the latter is useful for milk nearly to that age; the former loses his vigor at an earlier period.

Fossil Bovina.—The remains of deer and oxen occur abundantly in the tertiary beds, with extinct species of existing genera of Pachydermata, such as the elephant, rhinoceros, hippopotamus, and horse, and the extinct genera of the mastodon and large carnivora, as the tiger, hyena, and bear. The most interesting of these is the *Bos primigenius*, to which we have already alluded. This animal must have been a third larger than any existing bovine species, but the structure so closely resembles that of the domestic ox that Cuvier considered it to have been the original stock whence this proceeded. This opinion is now generally discredited, and the *Bos primigenius* is considered a distinct species. Other species of fossil ox found in Europe and America are the *Bos largifrons*, *Bos troccocerus*, *Bos bombifrons*, &c., &c. At the southern foot of the Himalaya Mountains abundant remains of bovine animals are found, mixed with those of the mastodon, elephant, rhinoceros, hippopotamus, hog, horse, elk, deer, crocodile, gavial, animals of the canine and feline families, &c., &c.



THE SYRIAN OX.

* In England the following terms are applied to cattle of different ages and conditions: a young emasculated male, after the first year, is called a *Stirk;* when a year older, a *Stot* or *Steer:* at five years old, an *Ox:* a female, after the first year, is called a *Heifer* or *Quey;* some coarse and sturdy Welsh and Scotch cattle are called *Runts*. *Bullock* is the general term for full-grown male cattle, fat or lean.



THE CAPRINA OR CAPRE.E.

This tribe, of which the *Common Goat* is the familiar type, are distinguished by ascending and diverging horns, in some cases of great size in the male, those of the female always being smaller; the hair is sometimes rough and sometimes silky; that of the chin is usually long on the male, and often forms a majestic beard; the tail is short, the legs slender but strong, the body thin and

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* As there is sometimes difficulty in distinguishing the species of *Caprina* from those of the *Ovina*, the following table showing the differences between the two, will be found convenient:

GOAT.	SHEEP.
Whole structure stronger and more compact	Less so.
Limbs thicker and more rigid	Feebler and more slender.
Hoofs higher and more compact	Lower and less so.
False hoofs well developed	Evanescent.
Head smaller and finer	Longer and heavier.
Facial line straight	Chaffron arched.
Ears shorter and rounded	Longer and pointed.
Tail short, flat, nude below	Longer, less depressed, and half nude only.
Fore-legs stronger than hind	Fore and hind equal.
Croup sloped off	Not so.
Odorous	Not so.
Nose moister, with nares short and wide	Less moist, longer and narrower.
Horns of medial size, keeled, and turned upward	Horns very large, not keeled, and turned to the sides.
Hair long and unequal	Short and equal.
Back arched	Back straight.
Bears change of climate well	Bears it ill.
Is eminently curious, capricious, and confident	Is incurious, staid, and timid.
Barks trees with its horns, feeding on the peel and on aromatic herbs	Does not bark trees, and is less addicted to aromatics.
In fighting, rears itself on its hind-legs, and lets the weight of its body fall on the adversary	In fighting, runs a tilt, adding the force of impulse to that of weight.

little inclined to fat. These animals are active and restless, and frequently move from place to place. They are distinguished by a sort of brisk and petulant manner in all their actions. When young, they are full of playful humor, running, leaping, and bounding among the hills and rocks; in old age they become grave and watchful. They are fond of the society of each other, and usually live in small flocks. Their natural haunts are among the remote and unfrequented ledges of the mountains, where they obtain a subsistence by browsing the scanty herbage or the buds and leaves of shrubs. They run with great speed, and the celerity with which they bound along the verges of the steepling cliffs seems almost like the flight of birds. The males have a strong and offensive odor; they butt by rising on their hind-legs and coming down sideways against their enemy. Such are the wild races: those which are domesticated are modified in some of these characteristics, but still the natural traits of the race are strongly marked upon them. They are divided into several genera.

Genus KEMAS: *Kemas.*—Of this there are two species, both distinguished by a naked muzzle and short horns, and both confined to the mountains of Asia. The WARRYATO KEMAS, *K. holocrius* of Ogilby, is found in certain mountainous districts of Hindostan; the JHARAL KEMAS, *K. Jemlaicus*—called *Jemlah Goat* by H. Smith—inhabits the most lofty ridges of Central Asia; it is also found in Nepaul. It is eminently scansorial and pugnacious, but is easily tamed, and readily acclimated in other countries. It is without beard, and the horns are of moderate size; it breeds with the domestic goat, and is said to resemble the tame varieties.



THE BOUQUETIN, OR IBEX.

Genus BOUQUETIN or IBEX: *Ibex.*—Of this genus, whose name of *Bouquetin* signifies *Buck of the Rock*, there are several species, all noted for their large horns bending over the back, their love of the wild, rocky heights of mountainous regions, and the activity and daring with which they bound along the verges of the most lofty precipices.



THE IBEX OF THE PYRENEES.

The Alpine Ibex, or Stein-Boc, or Rock-Buck, *I. Alpinus*, was formerly spread over all the loftier ranges of the Alps, but is now confined to the Alps of Savoy. They are not numerous, and would soon be exterminated were not the killing of them severely interdicted by the Piedmontese government.

The Tur, or Ibex of the Pyrenees, *I. Pyrenaicus*, very similar to the preceding, is nearly exterminated, and is only found among the very highest peaks of the Spanish Pyrenees.

The Spanish Ibex, *I. Hispanicus*, is found in the Sierra Nevada of the south of Spain.

The Zac or Zebuder—the Caucasian Ibex, *Capra Caucasica* of Guldenstedt—resembles the



THE PASENG.

Alpine species: it is found in the mountains of Caucasus, and also in those of Candia and some of the adjacent islands. This is probably of the same species as the Paseng, the *Hircus ægagrus* of Gray, which is found in large troops in the mountains of Persia and the adjacent countries. It exceeds the domestic goat in size, and is very strong and active; the color is a rusty brown;

the beard long, and the horns of the male large and slightly diverging as they bend over the back. On the whole, it greatly resembles the Ibex of the Alps.

Other Asiatic species of Ibex are as follows: the Tek or Takija, the Siberian Ibex, *I. Sibiricus;* the Sakeen or Skyn, or Himalayan Ibex, *I. Himalayanus;* the African species are the Beden or Jaal Ibex, *I. Nubianus*, found in Nubia and Upper Egypt, and also in Syria and Arabia, and held by some to be the same species as that found in Candia; and the Walie or Valie Ibex, *I. Valie*, found in Abyssinia.



ROCKY MOUNTAIN GOAT.

Genus CAPRA: *Capra.*—Under this head we include two species. The Rocky Mountain Goat—*Mazama* or *Spring-Buck*—*C. Americanus* of Richardson, regarded as an antilope by some naturalists, is about the size of the Common Goat, and bears a general resemblance to it. Both male and female have small horns, and hair of a white color. They live in small flocks in the lofty heights of the great range from which they derive their name, extending from 40° to 64° of north latitude. They feed on the plants, grasses, and mosses of the mountain slopes, bounding over the rocky cliffs and scaling the precipices with all the fleetness belonging to the race. The fleece is fine, the fore part resembling wool, and that on the back being like cotton. The whole is much mixed with long hairs. The flesh is hard and dry. The animal only exists in small numbers, is very shy, and is captured with difficulty.

This species is placed with the Antilopes by the "English Cyclopedia of Natural History," and there forms the genus *Mazama.* Gervais makes it the basis of the genus *Antilocapra*, which term others bestow on the *Prong-horned Antilope.*

Of the Domestic Goat, *Capra ægagrus* of Cuvier, *C. hircus* of Linnæus, there are numerous breeds, presenting great variety of appearance, but all possessing certain general characteristics which render them useful to man. They inhabit most parts of the world, and live on the scanty herbage of rocky places, where no other domestic animal could find footing. They are abundant in most parts of Europe, and in many parts of Asia, and are peculiarly serviceable to the poor,* as they need neither barns for shelter nor forage for food, but gather their meals in commons and waste places, not denied even to poverty. Their flesh is wholesome food, and the milk is tolerably nutritious. It is esteemed useful in many diseases, especially in consumption, and in the

* In France and Italy a pair of goats will sometimes yield half the support of a family of four persons. They are led forth to graze in the highway, being attended by a boy or girl. They will produce each three quarts of milk daily, which will sell for twenty cents. This sum, in these cheap countries, will supply the humble wants of two persons.



THE COMMON GOAT.

large towns of Italy, flocks of them are every day driven through the streets and milked at the places where the milk is wanted. The undressed skins of goats are the winter covering of a large part of the mountain shepherds and peasants of Europe and Asia. Many a poor family in France, Italy, Germany, Greece, and Spain would inevitably perish without the assistance of these humble brutes. In many cases goats are the wet-nurses of infants, and become so attached to them as to run and offer them their food on hearing their cries.

While goats are thus the friends of the poor, they contribute largely to the luxuries of the rich. The Cashmere shawls, made from the hair of certain species, are among the most valued and costly ornaments of fashionable beauty, as well among the sable princesses of India as the fairer belles of Europe. A first-rate Cashmere shawl has been often sold for five hundred dollars, some even for a thousand. The kid-gloves manufactured by millions in France, and distributed through Paris over all the fashionable world from San Francisco to St. Petersburg, are made of the skins of young goats. The skins of goats make the finest morocco, used for a thousand ornamental purposes, and especially for the delicate feet of the fair. The skins of goats, with the hair on, cover the dragoons' holsters and form the knapsack of the foot-soldier. Formerly—in the time of Louis XIV.—when men and women cut off the hair which nature gave them and wore wigs, the hair of the white common goats was in great request for this purpose. In England, at the present day, the lawyers, judges, and bishops wear wigs made of white goat's hair. The horns of this animal make excellent knife-handles, and their tallow the best of candles. Their hams, when salted and dried, are called *rock venison*, and equal those of the deer. The medicinal virtues of the milk have been already alluded to, and the cheese it produces is the boast of many a mountain dairy. We may add, finally, that goats are the most picturesque of animals, and many an artist has been indebted to the felicitous introduction of a flock of them, browsing among their mountain landscapes, for the chief interest of his picture.

As goats are thus useful to man—contributing alike to his commonest necessities and his most refined luxuries—they are in many other respects curious and interesting animals. The males have an offensive smell, but this is thought healthful to horses, on which account a he-goat is often an appendage of the stable. When mingled with sheep, the goats always take the lead, and the sheep follow in the rear. They are bold, impudent, familiar, capricious, observant of every thing that passes around them, and ready on the slightest occasion to defend themselves or make an attack. They do not push like bulls nor butt like rams, but rise and descend on the enemy with an oblique but effective blow. They are among the most sure-footed of animals, and will



MALE CASHMERE GOAT.*

pass along cliffs and ledges with security from which any other species would be hurled to destruction. If two of them meet on a ledge too narrow for them to pass, one kneels down and the other passes over his back! All their senses are exceedingly acute. They are intelligent, and may be trained to the harness and taught to draw small vehicles. One of the delights of the Champs Elysées of Paris, to the young, is to ride for a few sous in a coach drawn by six goats. The sportive humor of these animals may be turned to account in the performance of various tricks. Every reader will remember the manner in which Alexander Selkirk amused himself by teaching his goats to dance, and occasionally taking a rigadoon with them himself. Their favorite food consists of the tops, tendrils, and flowers of aromatic shrubs. They feed safely on many plants which are poisonous to other ruminants. Hasselgren says that they feed on four hundred and forty-nine different kinds of plants! They are fond of grape-vines, and so the ancients sacrificed them to Bacchus.

There has been great discussion as to the origin of the domestic goat. It is supposed by many learned men that the mountains of the earth must have been first inhabited by man, because they would first be dry and salubrious, while yet the valleys were filled with pestilent vapors, and therefore that the goat, being a mountain animal, must have been the first that was domesticated. However this may be, it is certain that it figures largely in the early annals of mankind. The Lybian Jupiter had the horns of a ram, and Pan, the symbol of the productive energies of nature, was furnished with the attributes of a goat. The ægis of Jupiter and breastplate of Minerva were a simple goat-skin. Under the Jewish ritual the goat was an important animal, and was the symbol of atonement in the splendid ceremonial imposed by the Supreme Lawgiver. The formidable war-tunics of the Cimbri were the skins of goats, and these were the winter dress of the Roman auxiliaries, as well in Britain as other northern provinces. Virgil, in his Georgics, directs the shepherds to shear the long beards and hair of the Cinyphean goats for the service of the camp. Varro tells us that goats' hair was used for the dress of sailors and coverings of engines of war. The

* The above engraving of a male Cashmere Goat is a portrait of one of two of these animals imported by Dr. J. B. Davis, in 1849, and afterward the property of R. Peters, Esq., of Atlanta, Georgia.

Celtic tribes of Europe bred goats long before they had cattle. The goat was the first domestic animal of Wales and the Highlands of Scotland.

But admitting this historical renown of the goat in connection with man, what was the source of the domestic breed, and are the diversified domestic breeds of Europe, Asia, and Africa all of one descent? Cuvier, and other eminent naturalists, regard the Paseng, the *Hircus ægagrus*, as the original stock of all the domestic breeds, and for this there seems good reason, as it has been found readily to breed with them; but still there are high authorities of a different opinion.

Leaving these questions, which, perhaps, can never be satisfactorily determined, we shall content ourselves with a brief notice of some of the more remarkable breeds. Throughout Europe and America the common variety prevails; in Asia there are several of very peculiar characteristics. The Angora Goat,* which is reared to a great extent in the vicinity of the city which gives it name, is noted for its fleece of soft, fine hair, resembling wool, and which is largely manufactured into various stuffs.



THE SYRIAN GOAT.

The Syrian Goats are remarkable for their long, pendant ears, and fine, long hair, used for the manufacture of various fabrics. This is probably the variety spoken of in the Bible, and of the hair of which the Curtains for the Tabernacle were made. It is found not only in Syria, but in Arabia and Egypt, and is taught to perform a variety of feats of dexterity, among which is that of standing with its four feet upon a number of cylindrical blocks like dice-boxes, placed endwise one upon another to the height of several feet.

The most celebrated variety, however, is the Cashmere Goat, which produces the fine wool of which the famous Cashmere shawls are made. They are spread throughout Thibet and the adjacent countries, where they are bred with great care. They are covered with long, fine, silky hair, under which, in the winter, there is a vest of the most delicate grayish wool. It is this which is wrought into the fabrics in question. Only about three ounces are annually produced by a single goat; the price of this, even in Thibet, is about a dollar and a quarter a pound. Several of these animals have been introduced into France and England; in both these countries a number have been successfully bred. Some have also been brought to the United States, and the attempt to breed them here has, we are informed, made encouraging progress.

* Angora is a city of 15,000 inhabitants in Asia Minor, to the northeast of Smyrna. Stuffs and yarn are here largely manufactured of the hair or wool of the Angora Goat. Of this 13,000,000 pounds are annually exported.



THE OVINA OR OVEÆ.

This tribe includes the *Common Sheep* and the allied species. These are all marked by a flat or concave forehead, triangular hoofs, horns more or less spiral and wide at the base. The horns are often wanting in the female. They are divided into two genera.

Genus MOUFLON: *Musimon.*—The animals of this genus are distinguished by short tails, rough hair, and enormous horns; they live on the mountains, and though their numbers are small, they are found widely dispersed in Europe, Asia, Africa, and America.

The Musmon or Mouflon, *M. musmon*—the *Capra Ammon* of Linnæus—is found in the mountains of Corsica and Sardinia, where it is called *Muffoli* and *Mufione*, from which Buffon formed the name *Mouflon;* it is said to be also found in the islands of Cyprus and Candia. It is about the size of the common sheep, but of a stouter frame; its covering is long, rough hair, beneath which there is finer hair resembling wool; the prevailing color is a vinous red above and a dirty white below; it is subject, however, to varieties of color; the horns of the male are deeply ridged and annulated. The animals of this species have a close resemblance to the common sheep in their habits: they assemble and pasture together in flocks, and though naturally shy and wild, are easily tamed, when they readily associate and breed with the domestic flocks. So strong, however, is the love of association, that if kept alone they soon pine away and die.

The Sha, or Kock, *M. Vignei*, is the wild mountain sheep of the north of India, and is also found in Thibet. We are told that numbers of these are forced in winter, by the snows, from the mountain heights down to the borders of the Indus.

The Armenian Sheep, *M. Orientalis*, is a native of Armenia.

The Nervate, or Sna of Nahoor—the *Pseudois nahura* of Hodgson—is a native of Nepaul.



THE MOUFLON.

The Argali, *M. argali*, often confounded with the preceding, is a noble species, found in the northern parts of Siberia, and also in Kamtschatka, in the mountains of which it is numerous. It is remarkable, even among this active genus, for the agility with which it speeds along the rocks and ledges of its native haunts.



THE ARGALI.

The Ruffed Mouflon, called *Kebsch* by the Arabs, *Aoudad* by the Moors of Barbary, and *Mouflon à Manchettes* by the French, is a native of the Atlas Mountains of Northern Africa, and is also found in Mt. Sinai, Ethiopia, and Abyssinia. It attains a very large size, measuring more



THE RUFFED MOUFLON. MERINO SHEEP.

than three feet in height at the shoulders. It is wonderfully agile, and leaps amazing distances from one cliff to another. This species is clearly delineated on the monuments of Egypt.

The Rocky Mountain Sheep—the Big Horn of Lewis and Clark; the *Argali* of Godman; the *Mouflon d'Amérique* of Desmarest—*M. montanus*, is a larger animal than the Mouflon, and fully equals the Argali. The male appears like a powerful ram; the female resembles an antelope. The horns of the male are enormous, measuring around the curve two feet and ten inches long; sometimes these bend so much forward and downward as to prevent the animal from feeding on the level ground. The weight of one of this species is about three hundred pounds. The hair is coarse and slightly crimped, but has no resemblance to wool; at the roots, however, there is a small quantity of soft fur. The color above is a light grayish-brown; beneath, it is grayish-white. The young are produced, one and sometimes two at a time, in June and July. In general, these animals are shy and wild, but in some secluded regions they seem not to have learned to fear mankind, and are approached without difficulty. Their flesh is excellent. They live in small flocks on the highest peaks of the Rocky Mountains, from latitude 30° to 68° north. They are said also to be met with in the plains west of the Mississippi, and in the mountains of California and Oregon. Dr. Gray, with good reason, thinks this animal the same as the Argali of Siberia and Kamtschatka. This might have crossed at Behring's Straits, in some remote period, and thus have stocked the northwestern regions of America.

Genus SHEEP: *Ovis.*—Of this, which includes the Domestic Sheep, there are perhaps forty well-known varieties. "With the exception of the dog," says a graphic writer, "there is no one of the brute creation which exhibits the diversity of size, color, form, covering, and general appearance, which characterizes the sheep, and none which occupies a wider range of climate, or subsists on a greater variety of food. In every latitude between the equator and the arctic, he ranges over the sterile mountains, and through the fertile valleys. He feeds on almost every species of edible forage, the cultivated grasses, clovers, cereals, and roots; he browses on aromatic and bitter herbs; he crops the leaves and bark from the stunted forest shrubs, and the pungent, resinous evergreens. In some parts of Norway and Sweden, when other resources fail, he subsists on fish



THE ROCKY MOUNTAIN SHEEP.

or flesh during their long and rigorous winters, and, if reduced to necessity, he eats his own wool. He is diminutive like the Orkney, or massive like the Teeswater. He is policerate or many-horned; he has two large or small spiral horns like the Merino, or is polled or hornless like the mutton sheep. He has a long tail like our own breeds, a broad tail like many of the eastern, or a mere button of a tail, like the fat-rumps, discernible only by the touch. His coat is sometimes long and coarse, like the Lincolnshire; short and hairy, like those of Madagascar; soft and furry, like the Angola, or fine and spiral, like the silken Saxon. His color, either pure or fancifully mixed, varies from the white or black of our own country to every shade of brown, dun, buff, blue, and gray, like the spotted flocks of the Cape of Good Hope, and other parts of Africa."*

Several of the breeds of sheep are marked with such peculiarities as to be regarded by some eminent naturalists as forming so many distinct species. The general opinion, however, is, that they all belong to one species, and that the diversities of form, color, and size, which we find among them, are the result of breeding, climate, and other circumstances. As to the original stock of the sheep, some have supposed it to have been the Mouflon of Europe, others the Argali, and others still, with much plausibility, maintain that the sheep is the result of a mixture of several allied species, not, however, including any of the wild races now known. But be this as it may, it is certain that the sheep was one of the earliest animals subjected to the sway of man; it is the very first of which we have any historical notice. Abel was a keeper of sheep. "Abraham and his descendants," says the author just quoted, "as well as most of the ancient patriarchs, were shepherds. Job had fourteen thousand sheep. It is said of Rachel, the favored mother of the Jewish race, 'She came with her father's sheep, for she kept them.' The seven daughters of the priest of Midian, 'came and drew water for their father's flocks.' Moses, the statesman and lawgiver, who 'was learned in all the wisdom of the Egyptians, kept the flocks of Jethro, his father-in-law;' and David, the future monarch of Israel, the hero, poet, and divine, was a keeper of sheep. It was to shepherds, while 'abiding in the field, keeping watch over their flocks by night,' that the birth of the Saviour was announced. The root of the Hebrew name for sheep signifies *fruitfulness*, *abundance*, *plenty*, as indicating the blessings they were destined to confer on the human race. With the sacred writers, they were the chosen symbol of purity and

* "Domestic Animals," &c., by R. L. Allen; published by O. A. Moore, New York.



THE LAMB.

the gentler virtues; they were the victims of propitiatory sacrifices; and finally, they became the type of redemption to fallen man. These may not be considered accidental allusions in a book whose every feature is full of design.

"Nor has the sheep been less the subject of eulogy and attention with profane writers. Among these, Homer and Hesiod, Virgil and Theocritus, introduced them with evident delight in their pastoral themes; while their heroes and demigods, Hercules and Ulysses, Æneas and Numa, carefully perpetuated them throughout their regal domains.

"In modern times, they have commanded the attention of the most enlightened nations, and their prosperity has in no instance been independent of these useful animals, wherever wool and its manufactures have been regarded as essential staples. Spain and Portugal, for more than two centuries, were the most enterprising nations of Europe, and during that period, they excelled in the production and manufacture of wool. Flanders for a time was before England in the perfection of the arts and the enjoyments of life, and England then sent the little wool she raised to that country to be manufactured. Her politic sovereigns soon found this a losing game, and offered large bounties for the importation of artists and machinery. By a systematic and thorough course of legislation, which looked to the utmost protection and augmentation of wool and woolens, she has carried their production beyond any thing the world has ever seen. The small islands of Great Britain and Ireland, in addition to the support of their 26,000,000 of people, 15,000,000 of cattle, 2,250,000 horses, 18,000,000 swine, and innumerable smaller domestic animals, maintain over 40,000,000 sheep, worth $250,000,000; and beside manufacturing nearly all their fleeces, annually import nearly an equal amount from abroad."

"We cannot doubt," says Buffon, "that most animals which are actually domestic were formerly wild; those whose history has already been given afford a sufficient proof of it; and there are still wild horses, wild asses, and wild bulls. But man, who has conquered so many millions



ENGLISH SHEEP: THE WASHING.

of individuals, can he boast of having conquered an entire species? As they were all created without his participation, may he not also believe that they all have had orders to grow without his help? If we consider, nevertheless, the weakness and stupidity of the sheep, and at the same time reflect that this animal, without defense, cannot find safety in flight; that he has for his enemies all devouring animals, which seem to seek him in preference to any other, and to devour him by choice; that formerly this species produced but few; that each individual lived but a short time, we shall be tempted to think that, from the beginning sheep were confided to the care of man; that they had occasion for his protection to subsist, and of his care to multiply, since it is a fact that there are no wild sheep in the deserts; that in all places where man does not rule, the lion, the tiger, and the wolf reign, by force and by cruelty; that these animals of blood and carnage all live long, and multiply much more than sheep; and in short, that if we were now to abandon the flocks which we have rendered so numerous, they would soon be destroyed before our eyes, and the species would be entirely annihilated by the voraciousness of its numberless enemies.

"The sheep is indeed absolutely without resource and without defense. The ram has but feeble arms; his courage is nothing but a petulance useless to himself, inconvenient to others, and which



THE SHEPHERD.

is destroyed by emasculation. The wether sheep are still more timorous than ewes; it is through fear that they gather so often in troops; the smallest noise to which they are unaccustomed is sufficient to make them fly and get close together. This fear is attended with the greatest stupidity; for they know not how to fly the danger, nor do they even seem to feel the inconvenience of their situation; they continue wherever they are, either in rain or snow, and to oblige them to change their situation they must have a chief who is instructed to walk first, and whom they will follow step by step. This chief will remain with the rest of the flock, without motion, in the same place, if he be not driven from it by the shepherd, or the dog which guards them, who, in fact, watches for their safety, defends, directs, and separates them, assembles them together, and communicates to them motives not their own. Goats, which in many things resemble sheep, have much more understanding.

"But this animal, so cowardly in itself, so wanting in sentiment and interior qualities, is to man the most valuable of all animals, and the most useful both for his present and future support. Of itself it supplies our greatest necessities: it furnishes us with both food and clothing. Without recounting the particular advantages we have from the milk, the skin, and even the bowels, the bones and the dung of this animal serve to prove that nature has given it nothing but what turns out useful to man."

This portrait of the sheep is drawn with the usual force and something of the exaggeration common to its author. It is only in its thoroughly domesticated state that this animal is cowardly. In mountainous countries, where it ranges over a wide extent, and with little control, it is deficient neither in courage nor intelligence. A ram or a wether will attack, and often defeat,

a single dog. He will even engage a bull, and as the bone of his forehead is much harder than that of any other animal, he is generally victorious in this apparently unequal contest. The bull, according to his custom, lowers his head, and is brought to the ground by the stroke of the ram between his eyes. When individual strength is not sufficient to afford protection, sheep will combine against dogs and other enemies. If these animals sprung from a wild breed, we cannot doubt that these were capable of defense, alike by instinct, activity, intelligence, and strength. If by domesticity we have deprived them of these qualities, it is because we have rendered them useless; in their place we have cultivated an unresisting gentleness, placidity, and docility, which at once forces upon man the necessity of giving them protection, and makes them what they are, one of man's greatest blessings.

PARTICULAR BREEDS OF SHEEP.

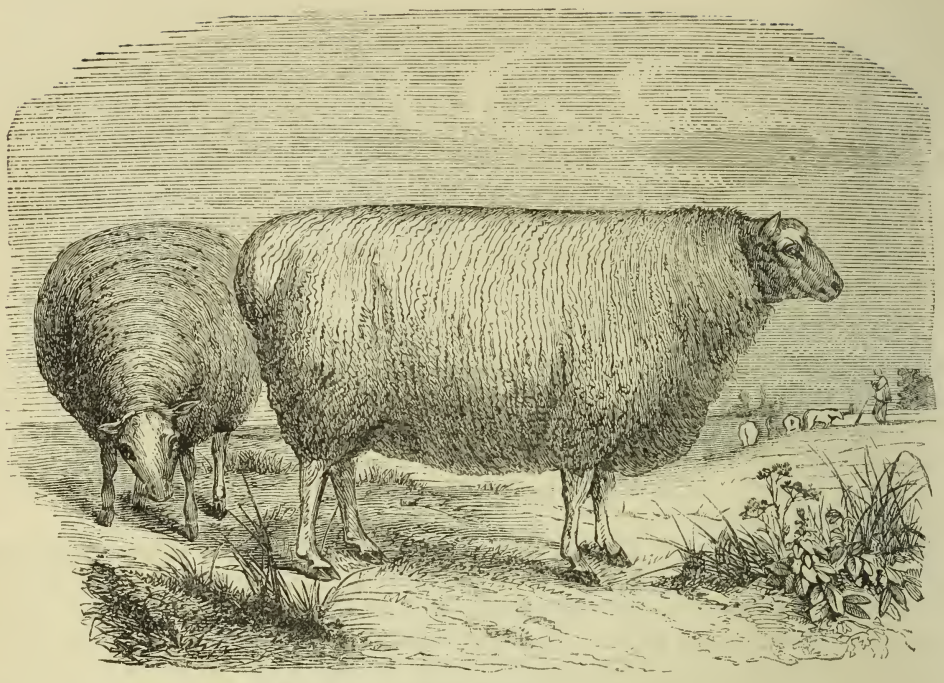
All the breeds of the common sheep in America are derived from Europe. The first settlers brought with them the domestic animals of the countries from which they emigrated, and thus the majority of our sheep were of English breeds. Within the last fifty years special attention has been paid, here as well as in Europe, to the breeding of sheep, with a view to their improvement, both in respect to the flesh and the wool; and, consequently, all the most valuable kinds are common in this country.

It is an argument in favor of the originality of the wool-bearing breeds of sheep, and against the idea that they are derived from any species of mouflon or ibex, that so early as the ancient days of Tyre and Egypt, these nations produced wool of exquisite fineness. The Greeks early possessed similar breeds, and these, no doubt, were planted, with their colonies, in Spain, along the coast of the Mediterranean. The Romans also, in the time of Augustus, had fine breeds of sheep, to which they paid great attention, and, doubtless, as Spain passed under their dominion, flocks of these were transported thither. From these sources, in the progress of centuries, we may fairly conclude the celebrated *Merino* was bred.

There are other breeds of sheep in Spain besides the Merinos, more or less intermixed with them; but of the pure race it is calculated that there are about ten millions, which are mostly migratory, and termed *Transhumantes*, being periodically conducted from one part of the country to another, and back again. These Transhumantes are divided into flocks, which, under the care of a mayoral, or chief shepherd, and assistants, migrate from the mountains of the north to the plains of the south in winter, and return back to the mountains in summer. The flocks follow the shepherds, who lead the way, and direct the length and speed of the journey: a few wethers, perfectly trained, tread in the footsteps of the conductor, and the rest follow in due order; a powerful breed of dogs accompany the shepherds in order to defend the flock from wolves, and a few mules carry their provision and other necessaries, as well as materials for making up the fold at night. This migration extends four hundred miles, and it takes fourteen weeks to accomplish it both ways. To this, popular opinion in Spain, no doubt erroneously, attributes the excellence of their sheep. In the south of France the sheep are in a similar manner driven in winter from the mountain regions of the Alps, Cevennes, and Pyrenees, to the softer climes of Provence and Languedoc.

The history of the Merino in America is too familiar to demand special notice here. It is sufficient to say that, from the year 1802 to 1811, a number of these were introduced into the United States by Chancellor Livingston, Colonel Humphries, and Mr. Jarvis, and thus the foundation of the breed was laid. At subsequent periods many others have been imported, and millions have been bred, so that the Merino is as well established in this country as any other, not excepting Spain itself.

The Saxon breed, an offspring of the Merino, produced in Saxony, and celebrated for the fullness and fineness of the fleece, has been also introduced, and is now extensively cultivated. The Merino bred in France, under the care of the government, at Rambouillet, Malmaison, and upon other royal farms, have also been brought hither and mingled with our flocks. The noted British breeds—*South-Downs*, *Cheviots*, *Bakewells* or *Leicesters*, *Teeswaters*, *Herefords*, *Dorsets*, *Dishleys*, *Kents*, *Devons*, *Devonshire-Nots*, *Dartmoor-Nots*, *Cotswolds* and *Lincolnshires*, and many others



FRENCH SHEEP.

—horned and hornless, long-wooled and short-wooled, coarse-wooled and fine-wooled, black-faced and white-faced—are all found on our farms, or at least known to our farmers and graziers. At the present time it is supposed there are 30,000,000 of sheep in the United States.*

Among the varieties of sheep distinguished for peculiar and striking qualities, we may mention the *Wallachian Sheep*, common not only in Wallachia but in Candia, Hungary, and Western Asia among the Tartar tribes. It is remarkable for its horns, which ascend almost perpendicularly from the skull, making a series of spiral turns, and thus sometimes rising to the height of a foot or even two feet. The fleece consists of long, straight hair, firm and close set, dividing on the back, and falling on each side almost to the ground. Beneath this is a quantity of short, fine wool. A ram of this breed, from Mount Parnassus, was some time since presented to the London Zoological Society, by Dr. Bowring; it was a large, powerful, and majestic-looking creature, but was unruly and vicious.

The Fat-rumped or Broad-tailed Sheep, found in Syria, Egypt, and the adjacent countries, are supposed to be the breed cultivated by the patriarchs and their descendants, the Jews. There are many varieties, some being covered with hair and some with fine wool; some have horns and some have none; some are of one color and some of another. Their general peculiarity consists in having a tail sometimes so enormously developed as to weigh fifty or even a hundred

* The number of domesticated sheep in different countries has been estimated as follows:

In Great Britain	40,000,000
France, of which nearly a million are Merinos, of various grades	28,000,000
Spain, of which ten millions are Merinos	20,000,000
Other countries of Europe	80,000,000
America	60,000,000
Australia, where sheep have been introduced and cultivated with great success	5,000,000
Asia and Asiatic islands, estimated	100,000,000
Africa and African islands	40,000,000
Total	373,000,000

A great part of this estimate is, of course, conjectural, but it may serve to convey to the mind an impression of the immense extent to which the sheep enters into the wants, comforts, and luxuries of man.



MERINO SHEEP.

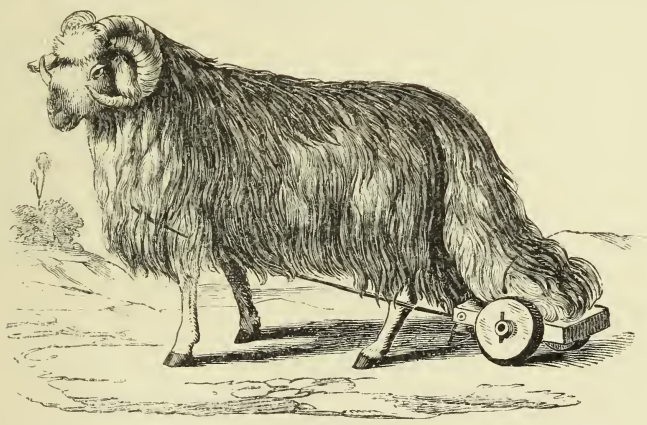




THE WALLACHIAN SHEEP.

pounds, and which it is often necessary to support with a board set on wheels! The fat of this appendage is said to resemble marrow, and is often used instead of butter. Some of this breed were brought into the United States fifty years ago, and a few were produced, the lambs being of various colors, white, red, tawny, black, &c., but there was difficulty in propagating them, and they have disappeared in mixtures with other breeds.

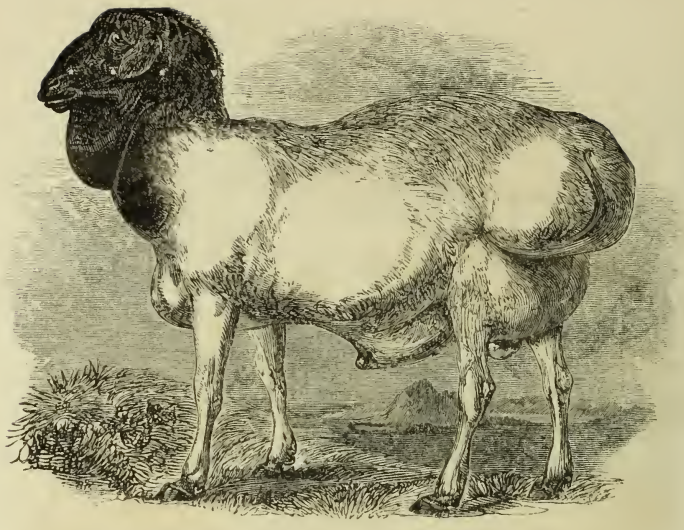
The PERSIAN SHEEP, found in Persia, Tartary, and the neighboring regions, is a singular variety, marked with an unsightly lump of fat on the croup. In Angola there are several peculiar breeds, one of which, called the ZENU, or GOITRED SHEEP, has drooping ears, a convex forehead, short hair, a brisket and dewlap like those of an ox, and two lobes consisting of hard, curdy fat beneath the throat, appearing like goitres. These are, however, not defects or deformities, but provisions of nature to sustain the animal at a season of the year when the earth, in the region it



THE BROAD-TAILED SHEEP.

inhabits, is parched, and vegetation withered or destroyed. In Tartary there is a breed called the ASTRACHAN SHEEP, whose lambs, taken from the womb by killing the mother a short time before maternity, yields a skin covered with beautiful curly hair, and which is sent to Russia, where it commands a high price. Some of them are of a glossy black, and are much valued.

In Southern Russia there is a breed called the FOUR-HORNED SHEEP, of which the rams have four and sometimes five and even six horns; and in the same region there is a breed in which both male and female are altogether destitute of horns.



THE GOITRED SHEEP.

In addition to these, there are still other breeds. The *Fezzan Sheep*, sometimes called the *Long-legged Sheep*, the *Morvan* of Buffon, is of very large size, and is common in Algeria and the vicinity. It has been introduced into Europe and crossed with other breeds. The *Black-headed Sheep*, is without horns, and is found in Abyssinia. The following peculiar kinds are included in the Catalogue of the British Museum: the *Barwell Sheep*, of Nepaul; the *Hooniah* or *Black-faced Sheep*, of Thibet and Nepaul; the *Kago* or *Tame Sheep*, of Cabul, a native of Nepaul; the *Curumbar Sheep*, of Mysore; the *Garar*, of India, the *Pachia* or *Hindoo Dumba;* the *Deccan Sheep*, the *West India Sheep*, the *Brazilian Sheep*, the *Demerara Sheep*, the *South American Sheep*, the *Smooth-haired Sheep*, the *Guinea Sheep*, the *St. Helena Sheep*, the *Morocco Sheep*, the *Congo Sheep*, the *Jaxulus*, the *Long-tailed Sheep* of Russia and the *Short-tailed Sheep* of the same country; and the *Tartar Sheep*, which is said to eat bones like a dog!

Such are some of the curiosities to be found among the almost numberless breeds of domestic sheep. They display a singular capacity, and indeed aptitude, in the race, for the production of varieties suited to the climate and circumstances in which they live—varieties in form, color, size, temper, and all the qualities which render them useful to man. There is, however, a principle in the nature of sheep, equally governing the ox, horse, and other races of domestic animals, of the greatest importance in breeding them, and that is, that *like produces like.* It is by the skillful application of this rule that intelligent breeders of sheep have been able, in England, France, Germany, and the United States, to produce new varieties almost at will, and suited to the wants of the community. It is by this means that nearly all the renowned English breeds have been brought into existence, thus greatly enlarging the circle of benefits bestowed on mankind by this simple and somewhat stupid animal—the sheep.



INCLOSURE OF ANTILOPES, GARDEN OF PLANTS, PARIS.

THE ANTILOPINA OR ANTELOPINA.

This tribe, including nearly a hundred species, none of which have ever been permanently domesticated, chiefly belong to warm climates; Africa is their great center, though several belong to Asia, one or two are found in Europe, and one in America. Australia and Madagascar are destitute of these as they are of other indigenous ruminants. They are of various colors, forms, and sizes; some of them bear resemblance to the ox, some to the goat, some to the sheep and even to the deer. There has been great difficulty in classifying them, and many of the species have been variously distributed by different authors. There is one general character in which they agree: while they are hollow-horned, and in this respect are like the ruminants we have described, the horns are round and annulated, yet not smooth like the horns of the ox, nor do they exhibit those prominent ridges and angles which are found in some of the buffaloes, and in the goats and sheep.* In the particular forms and curvatures of the horns there is the great-

* The Antilopes or Antelopes differ from the deer in the structure of the horns. In the deer the horns, or more properly antlers, are deciduous; but in the antilopes—and the same observation applies to the goat and ox—these organs consist of a horny sheath, investing a conical support of bone; their increase is gradual, and they are not yearly shed and renewed. The bony central support, or core, is a process from the frontal bone: in most antilopes it is solid, or nearly so: it commences small at first, and assumes various directions in the various species. Some antilopes have four horns. The horny sheath consists of fibers analogous to those of whalebone, or rather hair, running longitudinally or spirally, and agglutinated into one uniform mass. If this sheath be stripped from its bony core, the latter will be found covered by a highly vascular periosteum, from which the fibers in question are secreted. They are formed in regular succession as the bone grows, so that the horn which covered the whole process or core in the young animal, will in due time be thrown to its summit. The outermost layer was once in contact with the core, but was gradually pushed outward and upward. In some groups of antilopes both sexes are furnished with horns, in others only the male: and it is difficult in many cases to discriminate between the hornless females of one of the antilope and one of the deer tribe.

est possible variety; sometimes they are bent forward, sometimes backward; sometimes they are straight, sometimes spiral, and sometimes lyre-shaped. The females have two to four mammæ, and go from five to eight months, producing one, and sometimes, though rarely, two at a birth.

In general, the antilopes are covered with short, smooth hair of uniform length; some, however, have manes of bristly hair on the neck and shoulders; the ears are commonly long, narrow, and pointed forward; the tail is short, round, and tufted at the extremity. They are mostly gregarious, and unite in large herds, either permanently or at particular seasons of the year, but only for the purpose of migrating in search of more abundant and grateful pasturage; some species, however, live in pairs or small families, consisting of an old male and one or more females, with the young of the two foregoing seasons. Most of them are among the fleetest of animals, outstripping even the horse in their flight. They are extremely cautious in guarding against surprise, placing sentinels in various directions about their feeding-grounds to warn them of the approach of danger while grazing or reposing; and their vision and sense of smell are so acute, that it is only by using the greatest caution and circumspection that the hunter can bring them within range of the gun. The names by which they are distinguished in all languages, ancient as well as modern, have a direct reference to this quickness of sight, and to the brilliancy of the large black eyes which form so conspicuous a feature in them. Thus the word *Dorcas*, the Greek and Roman name of the Gazelle, or common Barbary Antilope, is derived from the verb "to see." The word Antilope, which zoologists have adopted as the generic name of the group, literally signifies "bright eyes." Among the Greeks and Romans, *Dorcas*, *Dorcalis*, and *Damalis*, all names of different antilopes, were common names of women, bestowed, without doubt, on account of the remarkable beauty of their eyes. Travelers in the East inform us that *Aine el Czazel*, "*You have the eyes of an antilope*," is the greatest compliment which at the present day an Oriental admirer can pay to his mistress.

Africa, as we have already intimated, may be considered the head-quarters of the antilope tribe. The habitat of these animals, however, differs according to the particular species. Some frequent the dry, sandy deserts, and feed upon the stunted acacias and bulbous plants which spring up even in the most arid situations; some prefer the open, stony plains, as the steppes of Central Asia and karroos of Southern Africa, where the grass, though parched, is still sufficient for their subsistence; some, again, inhabit the steep, rocky mountains, and leap from cliff to cliff with the ease and security of the ibex, while others are found only in the thick and almost impenetrable forests of tropical countries.

The antilopes have been variously classified. Dr. Gray arranges them into two divisions: *Antilopes of the Fields* and *Antilopes of the Desert*. These divisions are founded upon peculiarities of the nostrils, easily recognized. In the Antilopes of the Fields the nostrils are bald or free from hairs, while in the Antilopes of the Desert these organs are bearded within or covered with bristles. There are other distinctions, but these are the most obvious and most readily appreciated.

The first of these classes, *Antilopes of the Fields*, embraces the *True Antilopes*, as the *Gazelles*, the *Pallah*, *Stein-boc*, *Kleene-boc*, *Riet-boc*, *Sing-sing*, *Blauw-boc*, *Gems-boc*, *Oryx*, *Addax*, *Chamois*, *Prong-horn*, *&c.;* the second class, *Antilopes of the Desert*, embraces the *Gnu*, *Eland*, *Bless-boc*, *Koodoo*, *Nil-Ghau*, *&c.*, *&c.*

We deem it best, however, to follow the system we have hitherto pursued, and to present these animals in genera and species, believing that form to afford a clearer and more discriminating view than can be obtained in any other manner.

Genus ALCELAPHUS: *Alcelaphus.*—These animals have thick, heavy horns, of a double curve, and somewhat lyre-shaped. There are two species. The Bubalus, or Bekker-el-Wash, *A. bubalis*, is of a reddish fawn-color, with black horns, shaped like the tines of a fork. In its combats, it lowers the head like a bull. It is a powerful brute, but some of them have proved to be docile, and the young have been known to join the herds of domestic cattle and remain with them till their maturity. It is found living in herds in Northern Africa from Morocco to Egypt.

The Caama, Lecama, or Harte-Beest, *A. caama*, resembles the preceding, and has been con-



THE BUBALUS OR BEKKER-EL-WASH.

founded with it; its color, however, is deeper, in some parts becoming black, while the haunches are whitish. Its flesh has a high game flavor, and is much esteemed. It is found in Southern Africa, where it lives in large troops. Its speed rivals that of the horse.



THE GNU.

Genus CONNOCHETES: *Connochœtes.*—These animals have some resemblance to the ox: the muzzle is large and naked, the tail long and flowing; the horns are present in both sexes, and bend first downward and forward and then upward. The most noted species is the GNU or GNOO, *C. gnu*—the *Catoblepas* of Pliny; the *Antilope Gnu* of Linnæus. It has a formidable pair of horns, leading first downward and then upward, and has been called the *Horned Horse.* It is about the size of a well-grown ass; the neck, body, and tail resemble those of a small horse; the pace is a species of light gallop. A herd of Gnus, when seen at a distance flying over the plains, might be readily mistaken for a troop of the wild zebras or quaggas which inhabit the same local-



THE KOODOO.

ities, if their dark and uniform color did not distinguish them. They live in extensive herds on the karroos of South Africa, and are wild and difficult to approach. When wounded, they will turn upon the hunter and pursue him, dropping on their knees before making an attack, and then darting forward with amazing force and velocity. When first alarmed, they commence by flinging up their heels and capering like a restive horse, tossing their heads and tails, and butting at the mole-hills or other objects, but immediately after taking to flight, and traversing the desert with a speed which soon carries them beyond the reach of danger. They do not run in a confused crowd like sheep or oxen, but in single file, following a leader, and have a pleasing appearance as they skim over the level plains. They are said to be subject to a cutaneous eruption at particular seasons of the year, which they sometimes communicate to domestic cattle, and which invariably ends in death.

The Kokoon, *Antilope Taurina* of Burchell, and found in Abyssinia, is regarded by some naturalists as identical with the common gnu.

The Gorgon or Brindled Gnu, *C. Gorgon*, has a convex, smooth face, covered with hair lying toward the nose, the chest not being maned. It is of a black color, varied and striped with gray. It is the *Bastard Wilde Beest* of the Dutch at the Cape. It lives to the north of the Nu Gareep or Black River, and though herds feed on its banks, it is not known to cross it. It occurs on the large plains north of the Orange River, and when alarmed each herd decamps in long, regular files. The flesh is much sought after. The Bechuanas use the skins for their cloaks and mantles.

Genus STREPSICEROS: *Strepsiceros.*—Of this genus is the Koodoo, *S. coudou*, or *Kudu*, the *Condoma* of Buffon, the *Antilope Strepsiceros* of Pallas, one of the largest of antilopes,

measuring upward of eight feet in length, and being four feet high at the shoulder. The horns of the male are particularly magnificent; they are nearly four feet long, and beautifully twisted into a wide-sweeping spiral, surrounded by a prominent wreath which follows all their windings. They spread boldly and widely outward, and are carried crouched on each side of the back, on account of their great weight. The whole make of this animal is heavy, and the external appearance more resembling that of an ox than of an antilope. The ground-color of the back and sides is a light fallow-brown, with a narrow white ribbon along the spine, and eight or ten similar bands descending from the back, and passing obliquely down the sides and hips; the belly and under parts are pale silvery-brown. On the neck and withers is a thin, spare mane, of a brown color; the chin, throat, and breast are furnished with similar long hairs, forming a species of beard.

This magnificent animal inhabits the woody parts of Caffraria, and the contiguous country, principally along the banks of rivers, to which it readily takes when pursued, and swims well. It lives in small families of four or five individuals. When taken young they are readily domesticated, and show no inclination to regain their original freedom. The females produce one young at a time. The large antilope called *Aggergeen* by Pearce, in his account of his "Residence in Abyssinia," has been supposed to be the same as the koodoo of South Africa.



THE OREAS CANNA, OR ELAND.

The Oreas Canna or Eland, *Antilope Oreas* of Pallas, called by the various names of *Impoofoo*, *Cape Elk*, &c., is considerably the largest of all the antilopes, being the size of a good horse, and measuring eight feet two inches in length, and full five feet in height at the shoulder. The horns of the male are one and a half feet in length, very thick and heavy, almost straight till within three inches of the tips, where they bend outward, attenuated at the points, and surrounded throughout the greater part of their length with a thick spiral wreath, which passes twice completely round them, and finishes by becoming indistinct near the points. Those of the females are longer and smaller, and the spiral wreath is, in some specimens at least, scarcely to be seen.



STRIPED ELANDS DISCOVERED BY DR. LIVINGSTONE.

The head is long and pointed, the ears are large, the neck thick, compressed on the sides, as in the ox, and furnished underneath with a loose, hanging skin or dewlap, fringed along the margin with a border of long hair. There is likewise a large protuberance of the size of a man's fist on the larynx, and it was probably from this organ, which is likewise found in the elk of Europe, that the animal derived the name of *Eland*, by which it is universally known at the Cape. From the center of the forehead to the root of the tail runs a short erect mane of dark-brown hair, which is reversed on the neck, but directed backward in the usual manner along the spine of the back. The color of the body is uniform reddish-fawn on the upper parts, and white on the under; the head and neck ashy-gray, but in some individuals the latter color extends over all the upper parts of the body.

The Eland when full-grown usually weighs from eight hundred to a thousand pounds, and, contrary to the general rule observed among antilopes, is commonly extremely fat. Its flesh is consequently more prized than that of any other wild animal of South Africa, and the large muscles of the thighs, in particular, are held in the highest estimation when dried and cured, under which form they are denominated *thigh-tongues*. The character of this animal is very mild, and as it were predisposed to domestication; it is gregarious, and lives in large herds upon the open plains and low hills, the old males generally residing apart. This species were formerly very common in the immediate neighborhood of Cape Town, but were so much hunted that they have long since ceased to frequent the inhabited districts, and are now rarely met with except in the more distant and retired parts of the colony. Being generally very fat and pursy, they do not run well, and are soon fatigued; it is even said that when hard run a red oily perspiration has been known to ooze out from the pores of their skin, and that they occasionally drop down from plethora. Like most other animals when hunted, they always run against the wind. As the carcass is weighty, and consequently difficult to transport, the great object of the hunters, in the chase, is to turn their game in such a direction as to drive it close to their

own residence before killing it, and in fact the Cape farmers, from long practice and an intimate knowledge of the animal's habits, very frequently succeed in accomplishing this masterpiece of South African field-sports. They are so gentle that a man on horseback may penetrate into the very middle of a herd without alarming them, and pick out the fattest and best-conditioned, and as the old bulls are commonly chosen, on account of their greater size and weight, it not unfrequently happens that the herd is left altogether without a male. There have been several fine specimens of this animal in the Zoological Gardens, Regent's Park, presented by the late Earl of Derby.

The following extract from the recent Travels of Livingstone will be found interesting, as well from the picture it presents of the abundance of game in Southern Africa as from the accounts it affords of the curious habits of particular kinds of antilope. It also mentions a new variety of Eland, of which the engraving at page 532 is a representation. The country he is speaking of, *Sesheke*, is about 17° 30′ south latitude and 25° east longitude.

"This district contains great numbers of a small antelope named *Tianyáne*, unknown in the South. It stands about eighteen inches high, is very graceful in its movements, and utters a cry of alarm not unlike that of the domestic fowl; it is of a brownish-red color on the sides and back, with the belly and lower part of the tail white; it is very timid, but the maternal affection that the little thing bears to its young will often induce it to offer battle even to a man approaching it. When the young one is too tender to run about with the dam, she puts one foot on the prominence about the seventh cervical vertebra, or withers; the instinct of the young enables it to understand that it is now required to kneel down, and to remain quite still till it hears the bleating of its dam. If you see an otherwise gregarious she-antilope separated from the herd, and going alone anywhere, you may be sure she has laid her little one to sleep in some cozy spot. The color of the hair in the young is better adapted for assimilating it with the ground than that of the older animals, which do not need to be screened from the observation of birds of prey. I observed the Arabs at Aden, when making their camels kneel down, press the thumb on the withers in exactly the same way the antilopes do with their young; probably they have been led to the custom by seeing this plan adopted by the gazelle of the desert.

"Great numbers of *Buffaloes*, *Zebras*, *Tsessebes*, *Tahaetsi*, and *Elands* or *Pohu*, grazed undisturbed on these plains, so that very little exertion was required to secure a fair supply of meat for the party during the necessary delay. Hunting on foot, as all those who have engaged in it in this country will at once admit, is very hard work indeed. The heat of the sun by day is so great, even in winter, as it now was, that, had there been any one on whom I could have thrown the task, he would have been most welcome to all the sport the toil is supposed to impart. But the Makololo shot so badly that, in order to save my powder, I was obliged to go myself.

"We shot a beautiful cow-eland, standing in the shade of a fine tree. It was evident that she had lately had her calf killed by a lion, for there were five long, deep scratches on both sides of her hind-quarters, as if she had run to the rescue of her calf, and the lion, leaving it, had attacked herself, but was unable to pull her down. When lying on the ground, the milk flowing from the large udder showed that she must have been seeking the shade, from the distress its non-removal in the natural manner caused. She was a beautiful creature, and Lebeole, a Makololo gentleman who accompanied me, speaking in reference to its size and beauty, said, 'Jesus ought to have given us these instead of cattle.' It was a new, undescribed variety of this splendid antilope. It was marked with narrow white bands across the body, exactly like those of the koodoo, and had a black patch of more than a hand-breadth on the outer side of the fore-arm."

The Ginji-Jonga, or Derby's Oreas, *Oreas Derbianus*, is found in Northern Africa on the river Cassaman. It is of a plain reddish-brown color, with the front of the face, the neck, the front part of the under side, a spot on the front and upper part of the fore-leg, and the dorsal streak, mainly black.

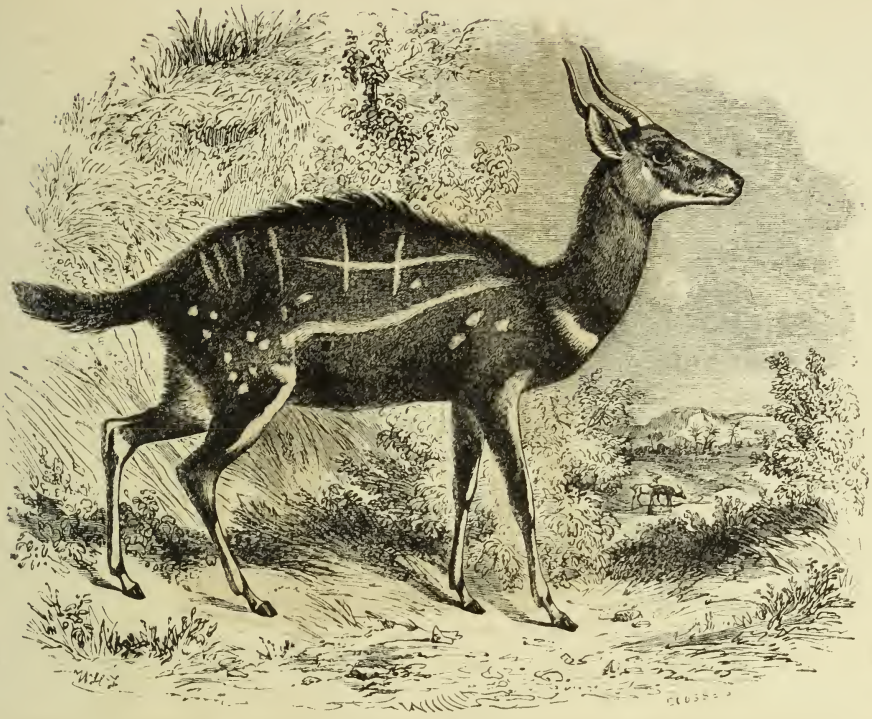
Genus ANOA: *Anoa*.—Of this there is one species, the *A. depressicornis*, or *Antilope depressicornis;* it is found in the Celebes islands, and is called Sapi-Outan or Cow of the Woods, by the natives. It has a thick, stout form, possesses two nearly straight, powerful horns, and is of the size of an ass; it is of a blackish hue, lives in the woods, and is a wild and savage animal.



THE NIL-GHAU.

Genus PORTAX : *Portax.*—Of this there is a single species, the Nil-Ghau or Blue Antilope, *P. picta* or *P. tragocamelus*, supposed to be the *Hippelaphe* of Aristotle. It is one of the largest of the Antilope tribe, being four feet high at the shoulders. The face is long and narrow, the muzzle large and naked; the horns, seven inches long, are straight, smooth, round, and thick; the hair is short, and the color a slaty-blue. It resides in the dense forests of India, whence it occasionally makes excursions very early in the morning or during the night, to feed upon the corn-fields of the natives which happen to be situated in the vicinity of the jungle. It is a vicious animal, of very uncertain temper, and as it is both powerful and resolute, and frequently turns upon its pursuers, it is seldom made an object of chase except by the native princes, who employ elephants for this purpose, or inclose the game in nets. The usual method which the Shikarrees, or professed hunters, employ for its capture, is to shoot it from an elevated platform, when it comes out at night or early in the morning to feed on the confines of the jungle; this being likewise their mode of destroying tigers, wild boars, and other beasts which they dare not attack openly. Even in confinement, and when domesticated from birth, the violent and changeable temper of the Nil-Ghau cannot be trusted. Previous to making an attack, it drops upon the fore-knees, advancing in this position till within a proper distance, then darting suddenly forward with the velocity of an arrow, and with a force which no ordinary animal can withstand. Yet, notwithstanding its vigor and resolution, it is the most common prey of the tiger. It has often been bred in confinement, both in England and India. The period of gestation is eight months, and two young are commonly produced at a birth. At first the young males are of the same reddish-brown color as the females, and only assume the grayish-blue shade proper to their sex on arriving at maturity: their growth is, however, rapid, and they attain their adult size in the second or third year of their age.

Genus TRAGELAPHUS : *Tragelaphus.*—Of this the most noted species is the Guib Antilope, *T. scriptus*, a graceful animal, about the size of a common deer, of a reddish fawn-color, but marked with white stripes along the back and sides, and with white spots on the haunches. These markings are prominent in both sexes; and as they resemble a harness, the species has been called the *Harnessed Antilope.* It is found in the western part of Africa, where it associates in extensive herds.



THE GUIB ANTILOPE.

The Decula, *T. decula*, found in Abyssinia, is grayish brown, and is marked on the back and sides with indistinct cross-bands and spots.

The Bosch-Boc, a name given by the South African colonists, and meaning *Bush-goat*, *T. sylvaticus*, has a body four feet long, and twisted, blunt horns a foot in length. The male is blackish brown above and white beneath; the female, reddish fawn above and white beneath. There are two white bands across the throat, and sometimes a white stripe along the back. It resides in the woods, which it never quits except during the bright moonlight nights, or early in the morning, when it comes out to graze on the border of the forest, or to make incursions into the neighboring gardens and corn-fields. Its voice resembles the barking of a dog, and its deceitful tone sometimes leads the benighted traveler into the most remote and lonely depths of the forest, in the vain search after some human habitation, which he is all the time leaving behind him. It is a slow runner, and easily caught when surprised in an open situation, but it keeps close to the woods, through which it penetrates with great ease, running with the horns couched backward along the sides of the neck, to prevent them from impeding its course by striking against the branches. Hence it has the neck and throat frequently denuded by rubbing against the underwood, as it forces its passage through the thick covers. The species is monogamous, the male and female being always found either alone or accompanied by one or two kids, but never by adult individuals. It is common enough in Caffraria, and in such parts of the Cape Colony as have sufficient forest to afford it a secure asylum; its flesh makes good venison, that of the breast being particularly esteemed.

The Broad-Horned Antilope, *Antilope Eurycerus* of Ogilby, has long, thick horns, slightly bent forward at the tips; there is a band across the eyes, and large spots on the cheeks and chin.

The Ingala, *T. Angasii* of Gray, has slender horns, a small head, marked with bands and spots, and is found in the region of Natal.

The Doria or Gilded Antilope, *Antilope Zebrata*, the *A. Zebra* of Gray, is of a bright golden color, with several cross-bands narrowing at the end; it is found in West Africa.



THE ORYX OR GEMSBOK.

Genus ORYX: *Oryx.*—Of this there are several species: the GEMSBOK or KOOKAAM, *O. Gazella*, *Antilope Oryx* of Pallas, is the *Oryx* of Cuvier, the *Papan* of Buffon, and the *Egyptian Antilope* of Pennant. It is a heavy, stout animal, about five feet in length, and three feet two inches high at the shoulder; the length of the horns is from two feet to two and a half, that of the ears seven inches, and that of the tail thirteen or fourteen inches. The horns are almost perfectly straight, very little divergent, and situated in the plane of the forehead. The general color is rusty iron-gray. It inhabits the karroos of South Africa: it is never found in the woods, but keeps on the open plains, and lives in pairs or small families of four or five individuals. It is extremely dangerous to approach when wounded, if not completely disabled, making vigorous use of its long, powerful horns, and it is said, being not unfrequently the first to commence the assault. We are even assured that the lion himself is afraid to attack this powerful and courageous animal, and that sometimes when, pressed by famine, he has ventured to do so, he has been beaten off with disgrace, or even paid for his temerity with his life. In evidence of this, we have from Dr. Livingstone the following description of a conflict which he witnessed in South Africa between a lion and a Gemsbok. Just as he and his guide emerged from a narrow defile between two rocky hills, they heard an angry growl, which they knew to be that of the monarch of the forest. At the distance of not more than forty yards in advance of them a gemsbok stood at bay, while a huge, tawny lion was crouched on a rocky platform, above the level of the plain, evidently meditating an attack on the antilope. Only a space of twenty feet separated the two animals. The lion appeared to be in a state of furious excitement; the gemsbok was apparently

calm but resolute, presenting his well fortified head to the enemy. The lion cautiously changed his position, descended to the plain, and made a circuit, obviously for the purpose of attacking the gemsbok in the rear; but the latter was on the alert, and still turned his head toward his antagonist. The maneuvering lasted for half an hour, when it appeared to the observers that the gemsbok used a stratagem to induce the lion to make an assault. The flank of the antilope was for a moment presented to his fierce assailant; as quick as lightning the lion made a spring, but while he was yet in the air the gemsbok turned his head, bending his neck so as to present one of his spear-like horns at the lion's breast. A terrible laceration was the consequence; the lion fell back on his haunches and showed a ghastly wound in the lower part of his neck. He uttered a howl of rage and anguish, and backed off to the distance of fifty yards, seeming half disposed to give up the contest; but hunger, fury, or revenge once more impelled him forward. His second assault was more furious and headlong; he rushed at the gemsbok, and attempted to leap over the formidable horns, in order to alight on his back.

The gemsbok, still standing on the defensive, elevated his head, speared the lion in his side, and inflicted what the spectators believed to be a mortal wound, as the horns penetrated to the depth of six or eight inches. Again the lion retreated, groaning and limping in a manner which showed that he had been severely hurt; but he soon collected all his energies for another attack. At the instant of collision the gemsbok presented a horn so as to strike the lion immediately between his two fore-legs, and so forcible was the stroke that the whole length of the horn was buried in the lion's body. For nearly a minute the two beasts stood motionless; then the gemsbok, slowly backing, withdrew his horn, and the lion tottered and fell on his side, his limbs quivering in the agonies of death. The victor made a triumphant flourish of his heels, and trotted off, apparently without having received the least injury in the conflict.

The *O. Beisa*, the *Antilope Beisa* of Rüppel, resembles the gazelles, and is found in Abysinia.

The Water-Buck or Photomok, *Kobus ellipsiprymnus*, is seven feet long and four high; the horns are thick and heavy, and marked by twenty-four prominent annuli. The most distinguishing mark of the species is a ribbon of pure white which passes over the croup and down each hip, uniting between the thighs, and forming a perfect ellipse, having the root of the tail in one of its foci, and contrasting most singularly with the dark, rusty iron-gray of the surrounding parts. It is to this mark, which is so peculiarly characteristic of the species, that the name of *ellipsiprymnus* refers. This animal is a native of South Africa. It receives the name of *Water-Buck* from its habit, when alarmed, of rushing into and crossing very rapid rivers. It lives in small herds on the banks of streams, and has not been known to occur south of 26° south latitude. The flesh is not regarded as good for food, as it has a rank, pungent smell, and disagreeable taste.

The Sing-Sing, *Kobus Sing-Sing*, differs in the tints of its coloring as well as the length of its hair at different seasons of the year. The general color is reddish or yellowish-gray-brown; the belly and legs, end of tail and legs, from shoulder to hock, black. The females are grayer and have the belly and upper part of the legs paler. This animal is called *Sing-Sing* by all the negroes. They do not think that their flocks will be healthy or fruitful unless they have a Sing-Sing with them, just as a fancy is entertained by some persons in England for having a goat in a stable. The English on the Gambia call it the *Jackass-Deer* from its appearance; it is called *Koba* and *Kassimause* by the negroes at Macarthy's Island. Its flesh is strong, and not pleasant eating.

The Leucoryx, *O. leucoryx*, referred to by various writers under the names of the *Milk-white Antilope*, the *White Antilope*, and the *Algazel*, is known to the Arabs by the names of *Abuhard*, *Jachmur*, and *Yazmur*, and to the Persians by that of *El-Walrugh-el-Bukras*. It is perhaps the most celebrated of all the antilope genus, being the species which is generally supposed to have given rise to the fabulous Unicorn of the ancients. It is, properly speaking, the *Oryx* of ancient writers, but many modern authors have followed the example of Pallas in bestowing that name upon the *Oryx Gazella*. The horns are long, slender, and bent slightly backward. The general color is milk-white, with some rusty-brown marks. It is gregarious, and feeds upon different species of acacias, and is found in large herds in Sennaar, Nubia, and Senegal. It is frequently represented on the monuments of Egypt and Nubia, and particularly in the inner chamber of



THE BLAUW-BOC.

the great pyramid at Memphis, where a whole group of them is depicted, some being driven or pushed forward, and others led by the horns or by a cord about the neck, apparently by way of tribute from some subject or conquered nation. With one exception these representations are in profile, so that only one horn is seen.

The Etaac or Blauw-Boc, *Antilope leucophœa*, is six feet long, three feet seven inches high, has round horns curved backward, and is of a bluish-black color, whence its name, which signifies *Blue Buck*. It is also sometimes called the *Blue Antilope*. It lives in pairs or small families in the open plains of Southern and Western Africa, is exceedingly swift, and when wounded is dangerous. Its flesh is eaten but is not relished. The French of Senegambia call it *Vache Brune*, and the Joliffs, *Kob* or *Koba*.

The *Takhaitze* of the Bechuanas—*Antilope barbata*—is a wild and ferocious but beautiful variety of the preceding.

The *A. equina* of Geoffroy is also a variety of *Blauw-Boc*.

The Black Buck, *Œgocerus Niger*, is black, with a white face marked with a dark streak; the female and young are brown. It is found in Southern Africa.

Genus GAZELLE: *Gazella*.—These animals are distinguished for their graceful forms and delicate limbs; their horns are black, shiny, and lyrate, and smaller in the female than the male; the face is conical and tapering; the fur short and close.

The Gazelle, *Gazella Dorcas*—the *Gazelle* of Buffon—the animal he describes as a distinct species under the name of *Corinne* being the female of this species. It is three feet and a half long, twenty-two inches high, the horns nine inches long; the ears are long, narrow, and pointed, the form light and elegant; the general color is a yellowish-red, with white patches and dark stripes on parts of the body; beneath it is white. It is found in Egypt and Barbary, where it lives in large troops upon the borders of the cultivated country, and also in the deserts. When pursued it flies to some distance, then stops to gaze a moment at the hunters, and again renews its flight. The flock, when attacked collectively, disperse in all directions, but soon unite, and when brought to bay defend themselves with courage and obstinacy, uniting in a close circle, with the females and fawns in the center, and presenting their horns at all points to their enemies; yet, notwithstanding their courage, they are the common prey of the lion and panther, and are hunted with great perseverance by the Arabs and Bedouins of the desert. When taken young they are easily domesticated, and soon become familiar. This animal is frequently cut upon the monuments of Egypt and Nubia.



FEMALE GAZELLE.

The Kevel or Flat-horned Antilope, *A. Kevella* of Pallas, is only the young of the Gazelle.

The Ariel Gazelle, *Antilope Arabica*—the *A. leptoceros* of F. Cuvier—is one of the most celebrated of antilopes; it is about two feet high at the shoulder; its limbs are slender but vigorous, and all its actions are light and spirited. In full flight it lays the horns back nearly on the shoulders, and seems to skim over the level plain almost without touching it. The general color above is dark fawn or yellowish-brown; the under parts are white, divided from the color of the upper parts by a black or deep brown band along the flanks.

This beautiful species inhabits Arabia, Syria, and Persia, where it is seen in large herds, bounding over the desert with amazing fleetness. Its eyes are peculiarly large, dark, and lustrous, and have supplied a simile to the Oriental poets and orators; indeed, to say of a woman, "*she has the eyes of a gazelle*," is a most flattering commendation. It is an object of the chase in Arabia, as it was among the ancient Egyptians, whose exciting delineations of it are abundant. Its flesh is said to be excellent. So swift are these animals, that the greyhound unaided cannot overtake them; the falcon, therefore, is brought into service. The huntsman advances as near as possible to the herd, the dogs are then slipped and the falcon thrown off; the individual which the dogs have singled is attacked by the falcon, which is trained to strike at the head and eyes, so as to confuse the game and check its speed, thereby enabling the dogs to come up to it.

Burckhardt informs us that on the eastern frontier of Syria are several places allotted to the hunting of this animal, or rather for its entrapment or destruction. An open space on the plain, about one mile and a half square, is inclosed on three sides by a wall of loose stones too high for the gazelle to leap over. Gaps are left in different parts of the wall, and at each gap a deep ditch is sunk on the outside. The inclosure is situated near some rivulet or spring to which the gazelles resort in summer. When the sport is to begin, many peasants assemble and watch till they see a herd of gazelles advancing from a distance toward the inclosure, into which they drive them. The gazelles, frightened by the shouts of the people and the discharge of the fire-arms, endeavor to leap over the wall, but can only effect this at the gaps, where they fall into the ditch outside and are easily taken, sometimes by hundreds. The chief of the herd always leaps first, and the others follow him one by one. The gazelles thus captured are immediately killed, and their flesh sold to the Arabs and neighboring Fellahs. Of the skin a kind of parchment is made, and used to cover the small drum with which the Syrians accompany some musical instruments or the voice.



THE ARIEL GAZELLE.

When taken young, wild and timid as the gazelle is, it is readily tamed, and becomes familiar and quite at ease. Tame gazelles are frequently seen at large in the court-yards of houses in Syria, and their beauty, exquisite form, and playfulness render them great favorites.

This animal, formerly regarded as a distinct species, is now held by most naturalists to be a variety only of the African Gazelle.

The Isabel Gazelle, *G. Isabella*, formerly supposed to be a variety of the Dorcas Gazelle, is considered a distinct species by Gray. It is found in Egypt and Kordofan.

The Pallah or Rooye-Boc—the *Betjuan* of the Caffers—*Antilope melampus*, is a magnificent species, four and a half feet long and three high. The general color is a deep red, the under parts being white. It inhabits Caffraria and the country of the Bechuanas, living on the open plains in families of six or eight individuals. They run with amazing swiftness, and occasionally leap like the Spring-Bocs, which they resemble in their general habits and manners. They are extremely numerous on the elevated plains in the neighborhood of Latakoo, and constitute a favorite object of the chase with the natives, as their flesh, though deficient in fat, is well-tasted and wholesome. *Pallah* or *Phaala* is the native name of the animal, but the mixed Hottentots, who travel into that country from the Cape, distinguish it by the Dutch term *Rooye-Boc* or *Red Buck*, on account of the prevailing color of its hair.

The Spring-Boc or Spring-Buck, Prong-Boc, Showy Goat or Tsebe, is perhaps the most graceful and the most beautifully varied in its colors, of all the antilope tribe. Imagination cannot conceive a quadruped more light and airy in form, more delicate in its proportions, or whose movements are executed with more natural ease and grace, than the Spring-Boc, or as



THE PALLAH.

the English colonists now universally denominate it, *Spring-Buck*. In point of size it is nearly a third larger than the Dorcas Gazelle. The horns are rather irregularly lyrated; they are round, black, annulated within a short distance of the points, spreading first backward and widely outward, and finally turning inward, and with an almost imperceptible twist on their own axis backward. The hair is long on the upper parts of the body, particularly on the back and croup, but smooth, sleek, and shining; it is of a beautiful light cinnamon-color on the shoulders, neck, back, sides, and thighs, and of a pure snowy-white on the breast, belly, and inner sides of the limbs, these two colors being separated on the flanks by a broad longitudinal band of a deep vinous-red color, larger and more distinct than in any other species of antilope. The whole head, face, cheeks, and chin are white, with a broad brown band on each side, from the eyes to the corners of the mouth, and a mark of the same color on the center of the face, commencing in a narrow point on the muzzle, and enlarging as it proceeds upward till it joins the reddish fawn-color of the body on the crown of the head. The eyes are large, lively, and of a brown color; the ears long, small, and cylindrical at the root, then widening in the middle, and ending in an attenuated point. The neck is long and slender; the hoofs small, black, and triangular; the legs remarkably long and slender. But the most remarkable and distinctive character of this species consists in two longitudinal foldings or duplications of the skin on the croup, which commence above the loins, or about the middle of the back, and run in a straight line from thence to the tail. The interior of these folds is lined with long hair of nine or ten inches in length, and of the most brilliant and snowy whiteness; they are likewise under the complete command of the animal's volition, and are opened and shut at pleasure. When closed, which they always are when the animal is at rest, their lips form a narrow line along the top of the loins and croup, which, being covered by the long cinnamon-red hair of the back and hips, is scarcely distinguishable, or only as a narrow white streak; but when the animal leaps or runs, these folds are expanded, and form a broad circular mark of the purest white, which extends over the whole croup and hips, and produces a most remarkable and pleasing effect.

The Spring-Buck is so called from its remarkable habit of jumping almost perpendicularly upward when disturbed or excited. It resides in very numerous flocks on the dry, arid plains and karroos of the interior of South Africa, seldom approaching the inhabited districts of the colony, unless in seasons of peculiar drought, when the pools and pastures of the interior are dried and burnt up by the excessive heat, and these animals are compelled to migrate in search of a

more abundant supply. On these occasions they unite into flocks which often consist of from ten thousand to fifty thousand individuals, spreading over the face of the whole country like a swarm of locusts, devouring every vegetable substance that they meet with, and scarcely deviating from their direct path to avoid the men and dogs which endeavor to turn them into another direction. These vast flocks, according to Mr. R. G. Cumming, will sometimes stream along in an unbroken, compact phalanx for two or three hours.

This migration is called at the Cape a *Trak Bokken.* So great is the number of animals in these migrations that those which happen to get into the rear of the troop are lean and half-starved before the migration is concluded, from the advanced ranks cropping the scanty pastures almost bare, and thus leaving those behind nearly destitute of food; but when the journey is concluded, and the troop begins to retrace its steps northward, those which formed the van during the advance are necessarily in the rear returning, soon lose their plump condition, and are in their turn subjected to want and starvation. During these migrations the herds are closely followed by lions, panthers, hyenas, and wild dogs, which hang upon their flanks and destroy great numbers of them. There is perhaps no spectacle in nature more inspiring than a flock of these beautiful antilopes enlivening the dreary brown karroos of South Africa with their graceful motions; now leaping perpendicularly upward to the height of six or seven feet, displaying at the same time the snowy-white marks on their croups, and anon flying over the desert with the speed of a whirlwind.

It is only when disturbed or otherwise excited that they make those extraordinary springs from which they have derived their name; nor do they ever display the white mark on their rump except on these occasions. They are said to be particularly affected by changes of the weather, and are observed to leap more than usual before the setting in of the south wind, which, at the Cape of Good Hope, generally betokens stormy weather, and is always violent and tempestuous. When taken young, the Spring-Buck is easily tamed, and soon displays all the petulance and familiarity of the common goat, butting at every stranger that approaches it, and warding off stones or other objects thrown at it with its horns.



THE COMMON ANTILOPE.

The Sasin or Common Antilope—*Antilope Bezoartica* of the English Cyclopedia of Natural History, *A. cervicapra* of Pallas—is one of the most beautiful of the antilope tribe. Its length is four feet, its height two and a half; the legs are long and delicate; the body round, but light and well formed; the head small; the eyes large, lively, and expressive; the ears long, cylindrical,

and in continual motion; and the horns forming a complete spiral of two or three turns, wrinkled at the base, distinctly annulated in the middle, and smooth for a couple of inches next the points. The old males are nearly black above and white beneath. In their flight these animals outstrip the greyhound; they leap over heights of twelve and thirteen feet, and pass over ten and twelve yards at a single bound. They reside on the open plains, where they can see to a great distance in every direction, live in large families of from five or ten to fifty or sixty grown females to a single male, and when they feed, or lie down to ruminate, detach a number of the young bucks to a distance of two hundred or three hundred yards on every side to watch over the common safety. Nothing escapes the notice of these careful sentinels; every bush or tuft of grass that might be suspected to conceal an enemy is strictly and attentively examined, and on the first alarm the whole herd betakes itself to flight, following closely in the footsteps of an old buck, and is soon beyond the reach of pursuit. The venison is dry and unsavory, and being held in small esteem, consequently holds out little inducement either to the occasional sportsman or to the professional hunter.

This species extends over every part of India, from the borders of Persia to the most eastern parts of which Europeans have any distinct knowledge. Some naturalists hold that it exists in Africa. It frequents rocky, open plains, but avoids woody localities and the thick cover of the forest. The fakirs and dervishes of India polish the horns and form them into a kind of offensive arms by uniting them at the base; these they wear at their girdles instead of swords and daggers, which their vows and religious character prevent them from using.

The Mohr or Mhorr, *G. Mohr*, is four feet two inches long, and two feet six inches high. The horns are round, annulated, and bent forward at the tips. The general color is yellowish-red; beneath, white. It is a native of Western Africa. The species is not found in the empire of Morocco, but individuals are occasionally brought thither from the opposite confines of the desert; the animal is much sought after by the Arabs on account of producing the *bezoar-stones* so highly valued in eastern medicine. These stones are commonly called in Morocco *Baid-el-Mhorr*, or *Mhorr's Eggs*.

The Abyssinian Mohr, *G. Sœmmeringii*, is considerably larger than the gazelles we have described; the horns are irregularly lyrated, and marked with fifteen or sixteen rings; the upper parts are a beautiful yellowish dun-color; beneath, they are pure white. It frequents hills of moderate ascent in the eastern provinces of Abyssinia, and lives in pairs.

The Nanguer—the *Antilope dama* of Pallas—was originally described and figured by Buffon from materials brought by Adanson from Senegal: since that time the animal has not been seen by any naturalist, and as the description of Buffon is imperfect, doubt may be entertained whether it be not in reality the young of the Mohr.

The Andra, *G. ruficollis*—the *Antilope ruficollis* of Smith—is a beautiful species of Eastern Africa. The length is five feet four inches, its height three feet. The horns are precisely similar to those of the Mohr already described, as are likewise the general form and proportions of the body. It is gregarious, and resides in flocks on the desert between Nubia, Dongola, and Kordofan.

The Korin, *G. rufifrons*, is of a bay-brown color, the sides above paler.

The Chikara, *Tragops Bennettii*—the *Antilope quadricornis* of Blainville—called *Ravine-Deer*, *Goat-Antelope*, *Kalsiepie* or *Black-Tail*, is of a bay-brown color, and has the end of the nose and tail black; the face streaked: chest, belly, and inside of the limbs, white; the feet black or brown. It is found on the rocky hills of the Deccan, and differs from many other antilopes in not being gregarious, there being rarely more than three or four found together in the same company, and not unfrequently one is found alone.

The Ahu or Jairou, *G. subgutturosa*, is of a pale-brown color above and white beneath. It inhabits all the central parts of Asia, Persia, Daüria, the country around Lake Baïkal, and from the eastern limits of Great Bucharia to the shores of the Hellespont. It associates in extensive flocks, frequents the open plains and naked hills of moderate elevation, and feeds principally upon the *Absinthium Ponticum*. The flesh is much esteemed.

The Bastard Harte-Beest or Sassaby, the *Antilope lunata* of Burchell, is of a rufous glau-

cous color, with the outer sides of the limbs dark. It inhabits the south of Africa, between Latikoo and the tropic of Capricorn. It lives in herds of six or ten, in the flat or wooded districts. The flesh is esteemed. When not disturbed it is confiding and curious, but when hunted it becomes shy.

The Korrigum, *A. Senegalensis*, is of a reddish-gray color; the front of the face, from nose to occiput, a small spot behind the eyes, a small streak above the angle of the mouth, streak on outside of limbs above the knees, and tuft of the tail, black. This animal is a native of West Africa, on the Gambia River and Macarthy's Island. It is called *Yonga* or *Yongah* by the Joliffs, and *Tan-Rong* by the Mandingoes.

The Nunni or Bonte-Boc, *A. pygarga*, is of a simple red color; the outer side of the limbs darker; the streak between the horns, face, and rump above the tail, white; the temple and upper part of throat whitish; the legs whitish; upper and lower part brown, varied. The female has the throat and under part of the body white. The terms *Kob* and *Koba* are applied to various kinds of antilopes by the negroes, and probably also to this species.

The Bless-Boc, *A. albifrons*, described by Burchell, is of an exceedingly slender form, and is found in South Africa.



THE ADDAX.

The Adax, *A. Addax*, is mentioned by Pliny under the name of *Strepsiceros*, which, he says, the Africans call *Addax*. From the time of Pliny to a recent date this animal was not discovered; but it is now ascertained to exist in Central Africa, where it lives in pairs on the sandy deserts. The body is five feet long, the height three feet. The general color is grayish-white, though the head and neck are of a reddish-brown.

Genus CAPRICORNIS: *Capricornis.*—This comprises the Cambing Outan, *C. Sumatrensis*, the *Antilope Sumatrensis* of Shaw, found in Sumatra; the Thar, Serow, or Imo, *C. Thar or Bubalina*, found in Nepaul; the Japanese Goat-Antilope, *C. crispa* of Temminck, found in Japan; and the Goral or Nepaul Bouquetin, a large kind, found in herds in the elevated plains of Nepaul. This last forms the genus *Kemas* of Ogilby and *Nemorhedus* of Gray.

Genus ANTILOCAPRA: *Antilocapra.*—Of this there is a single species, the Cabrit or Prong-horned Antilope of North America, *A. furcifer*, the only kind of antilope found on this continent. It differs from all the other members of the tribe in several respects, and especially in having a prong or branch to the horns. It is about four feet long and three feet high; the horns rise perpendicularly from the skull till within two or three inches of the points, where they curve suddenly backward and inward, forming a small hook like those of the chamois. The prong is situated upon their anterior face, and in adult animals about half-way up from the root; below it



THE PRONG-HORN.

the horns are strongly compressed, rough, and scrabous or pearly, like the antlers of deer; above it they are round, black, and polished. The prong itself is also very much compressed; it is little more than an inch in length, and points forward, upward, and a little outward. The ears are long, narrow, and pointed; the tail short and bushy; the eye large and lively; the limbs long and slender; and the whole form and appearance of the animal peculiarly graceful and elegant. The head, ears, and legs are covered with short, close hair of the common description, but that of the body is long and padded, and of a texture altogether different from that of other animals. It is tubular or hollow within, like the feather of a bird, but so brittle and devoid of elasticity that it snaps with the smallest effort, and, when pressed between the finger and thumb, crushes like a reed and never regains its original form. It stands directly out at right-angles to the hide, is about two inches long on the back, sides, and buttocks, but from the ears half-way down the neck it exceeds six inches in length, and forms an erect mane, equally conspicuous in both sexes. On the nape of the neck, shoulders, back, and hips, it is of a uniform fawn-color for half an inch at the point, and light-blue with a tinge of rose-color at the root; on the sides, chest, and belly, the latter color prevails at the root, and the point is of a pure and shining white. The extremities are uniform light fawn-color throughout, except on the interior of the fore-arms and thighs, which are white. A broad disk of pure white also surrounds the tail, and passes over the croup, and the throat is likewise marked with two transverse bands of the same color. This is the winter dress of the animal; but in summer, when the new coat appears, it has at first the ordinary texture and appearance of common hair, and only assumes the appearances here described on the approach of the cold season.

The Prong-Horn inhabits all the western parts of North America, from 53° of north latitude to the plains of New Mexico and California, that is, presuming this species to be the *Mazama* of Hernandez: it is particularly numerous on the banks of the southern branch of the Saskatchewan, and on the upper plains of the Columbia River, and a small herd annually visits the neighborhood of the station called Carlton House, where some even linger throughout the winter. They are gregarious, frequent the open plains and hills of moderate height, never inhabit closely-wooded districts, and migrate from north to south according to the season. When the ground is clear, their speed surpasses that of most other animals, but a good horse easily outstrips them after a slight fall of snow. They are extremely curious, and the Indians, and even the wolves, know how

to take advantage of their curiosity to get within reach of them, by crouching down, and moving forward or stopping alternately. The antilopes wheel round and round the object of their attention, decreasing their distance at every run, till at last they approach sufficiently near to be shot or captured. This habit renders them an easy prey, but as their flesh is not much esteemed by the Indians, they are only hunted by them in times of scarcity. The females produce one kid, and occasionally two kids, early in the month of June.

Gervais makes this species the basis of the genus *Dicranocerus*, while he applies the term *Antilocapra* to the *Rocky Mountain Goat*.



THE CHAMOIS.

Genus CHAMOIS: *Rupicapra*.—Of this there is a single species, the Chamois or Gems—*Antilope rupicapra*. It is the only animal of western Europe that partakes in any degree of the character of the antilopes. The horns are six or seven inches long, the body about three feet three inches, and the height at the shoulders about two feet. The whole body is covered with long hair, hanging down over the sides, of a deep-brown color in winter and brownish fawn-color in summer, being in spring slightly mixed with gray; the head is of a very pale yellow or straw-color, with a dark-brown band on each side, passing from the root of the ears to the corners of the mouth, and encircling the eyes and base of the horns; the tail is short and black, and the edges of the hips and interior of the thighs and ears alone white. The face is straight, as in the goat; the ears small, erect, and pointed; and the chin without a beard. In old individuals, particularly during the severe colds of winter, the cheeks, chin, and throat turn white, and the breast and belly are at all times of a light silvery brown or yellow. Underneath the external covering there is a short, thick coat of fine wool, which lies close to the skin, and protects the animal from the rigors of the cold mountain regions which it inhabits. The colors of both sexes are the same, but the females are rather smaller than the males, and have horns less abruptly hooked backward. They go five months with young, and kid in March or April, producing one, or, very rarely, two at a birth, which they suckle till the October following. The young are at first of a uniform deep yellowish-brown, with the lower jaw, sides of the head, and throat, white, and the same dark bands through the eyes as in the adults, only not extending so far back on the head.

The chamois, like the ibex, inhabits the loftiest chains of the primitive mountain ridges, and displays all the vivacity, restlessness, and agility of the common goat. It is extremely impatient

of heat, and during summer is only to be found on the tops of the highest mountains, or in deep glens where the snow lies throughout the year; in winter, however, it descends to the lower ridges, and it is then only that the hunters can pursue it with any hope of success. Its senses of sight and smell are remarkably acute; it scents a man at a very great distance, and displays the greatest restlessness and alarm till it obtains a sight of the object of its terror, leaping upon the highest rocks at hand in order to command a more extensive prospect, and uttering a suppressed whistle or hissing sound, being all the time in a state of the greatest agitation; but no sooner does he appear in sight than it flies with the utmost speed, scaling rocks which few other animals could attempt, and, if not intercepted by stratagem, soon leaves its pursuer far behind. The usual and most successful mode of hunting the chamois is, therefore, for a party of hunters to unite, and surround some mountain glen which they are previously known to frequent for the purpose of lying on the fresh snow during the daytime; toward this point the hunters advance simultaneously, when the animals, of course scenting those which come down the wind, retire in an opposite direction, and are intercepted by another portion of the company.

The food of the chamois consists of mountain herbs, flowers, and the tender shoots of trees and shrubs; it seldom drinks. Nothing can be more admirable than the agility with which it ascends and descends rocks apparently perpendicular. It does not descend at a single bound nor in a vertical direction, but projecting itself obliquely or diagonally forward, striking the face of the rock three or four times with its feet for the purpose of renewing its force, or directing it more steadily to the point it aims at; and in this manner it will descend a rock almost perpendicular of twenty or thirty feet in height, without the smallest apparent projection upon which to rest its feet. This animal is extremely partial to salt, and many stones are met with in the Alps hollowed by the continual licking of the chamois on account of the saltpeter with which they abound. The species is found in all the high mountain-chains of Europe and western Asia, in the Pyrenees, the Alps, the Carpathian and Grecian mountains, the chains of Caucasus and Taurus, and probably it exists in other situations.

Genus PANTHOLOPS: *Pantholops.*—Of this there is a single species, the Chiru, *P. Hodgsonii*, which has horns nearly two feet in height, and slightly bent forward at the tips. The hair is thick and of a dirty fawn-color. This animal lives in Thibet, on the slopes of the Himalayas; it is said to defend itself boldly against the hunters. It is supposed to be the *Unicorn* of the Bhotias, and the *Kemas* of Ælian.



THE RIET-BOC.—(See p. 548.)

Genus SAIGA: *Saiga.*—Of this there are several species. The Tartarian Saiga, *S. Tar-*



THE EQUITOON.

tarica, is the *Colus* of Strabo. It lives in herds among the Altaï and Ural mountains, and wanders from place to place in search of food. The body is fawn above and white beneath. When the flock reposes, one of their number keeps guard, and the males defend the young from the wolves and foxes. At some seasons the males have a strong musky smell. These animals are easily domesticated when taken young, and do not in that condition show any disposition to stray away with the wild ones. They are the only true species of Antilope found in Europe.

The Indian Saiga, *S. cervicapra*, is fawn above and white beneath, with a brown line upon the flanks. It is found in India.

The Goitred Antilope, Dzeren, Whang Yang, or Yellow Goat, *Antilope gutturosa*, and the Goa or Ragoa, *Procapra picticauda* of Gray, are both of Thibet.

The Reh-Boc or Rhee-Boc, or Peele, is five feet long, and two and a half high; the hair is woolly, and the color an ashy-gray. Its form is light and graceful, and it runs swiftly with long strides, moving close to the ground; it lives in small families on the sides of hills, and is common in Southern Africa.

The Inghalla, Riet-Boc, or Reed-Buck, is of a deep reddish fawn-color; it lives in pairs or small families, frequenting the reedy borders of mountain streams. It is found in South Africa, but at some distance from the Cape.

An animal called Roode Rhee-Boc, or Red Roebuck, *Antilope fulvo-rufula*, is found in the same regions as the preceding, and is probably a variety of that species.

The Wanto or Nagor, *Antilope redunca*, is four feet long, two feet four inches high; the color a fawn or pale red. It is found at Goree, in Western Africa. This, too, is probably a variety of the Riet-Boc.

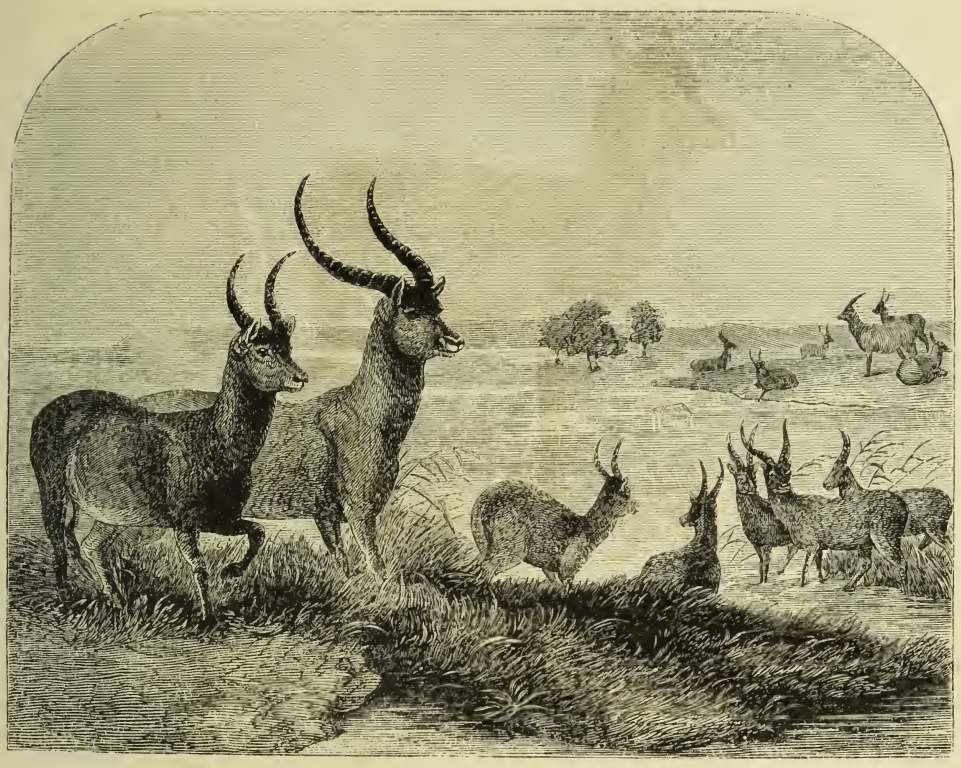
The Bohor, *A. Bohor*, is also regarded as a variety of the same by Dr. Gray.

The Equitoon or Kob, *A. adenota*, is of a pale-brown color, lives in small herds on the Gambia, and resembles the gazelles.

The Lechee,* *A. lechee*, is of a pale-brown color above, and white beneath, and is nearly as large as the water-buck. It lives in Southern Africa along the River Zouga.

* This species is spoken of as below by Livingstone in his "Travels;" the country where it was met with, about latitude twenty degrees north and longitude twenty-three degrees east, seeming to be a paradise of wild animals:

"We found the elephants in prodigious numbers on the southern bank. They came to drink by night, and after having slaked their thirst—in doing which they threw large quantities of water over themselves, and are heard, while enjoying the refreshment, screaming with delight—they evince their horror of pitfalls by setting off in a straight line to the desert, and never diverge till they are eight or ten miles off. They are smaller here than in the countries farther south. At the Limpopo, for instance, they are upward of twelve feet high; here, only eleven; farther north we



THE LECHE AND POKEE ANTILOPES DISCOVERED BY LIVINGSTONE.

Genus CEPHALOPUS: *Cephalopus.*—Of this there are several species. The CHOUSINGHA, *T. quadricornis*, belongs to a group of antilopes which have four horns, and hence are arranged by some naturalists, as a genus, under the name of *Tetracerus*. The Chousingha is two feet nine inches long, and one foot nine inches high. The general color is bright bay above, and silvery white beneath. The two superior or common horns are three inches long, smooth, black, erect, and divergent; the additional pair are blunt, stumpy, and three-fourths of an inch high. This species is monogamous, and lives in pairs in the forests and thick jungles; it is common in all the wooded districts of India, and is particularly abundant in Bengal, Bahor, and Orissa.

The CHIKARA, *T. tragops*, is found in the same regions as the preceding. Like that it has four horns, and is a wild and active species, only capable of being tamed by being taken young. It is supposed that the *Four-horned Oryx* of Ælian referred to this species.

The RUSTY-RED CHOUSINGHA, *T. Iodes*, is an Indian species, described by Hodgson.

The FULL-HORNED CHOUSINGHA, *T. paccervis*, is another Indian species.

The JUNGLIBURKA, *T. subquadricornutus*, is distinguished by its front pair of horns being rudimentary and tubercular. It is a native of Bombay.

The STEIN-BOC, *Antilope tragulus*, is one of the most graceful and elegant of the antilope tribe.

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shall find them nine feet only. The koodoo or tolo seemed smaller, too, than those we had been accustomed to see. We saw specimens of the kuabaoba, or straight-horned rhinoceros, *R. Oswellii*, which is a variety of the white, *R. simus*, and we found that, from the horn being projected downward, it did not obstruct the line of vision, so that this species is able to be much more wary than its neighbors.

"We discovered an entirely new species of antilope, called *Leche* or *Lechwi*. It is a beautiful water-antilope, of a light brownish-yellow color. Its horns—exactly like those of the *Aigoceros ellipsiprymnus*, the water-buck or tumogo of the Bechuanas—rise from the head with a slight bend backward, then curve forward at the points. The chest, belly, and orbits are nearly white, the front of the legs and ankles deep brown. From the horns, along the nape to the withers, the male has a small mane of the same yellowish color with the rest of the skin, and the tail has a tuft of black hair. It is never found a mile from water; islets in marshes and rivers are its favorite haunts, and it is quite unknown except in the central humid basin of Africa. Having a good deal of curiosity, it presents a noble appearance as it stands gazing, with head erect, at an approaching stranger."

Its legs are longer and smaller in proportion to its bulk than in any other species; its body is compact and well made; its head small, pointed, and ending in a well-formed naked muzzle, and its tail reduced to a mere tubercle, scarcely perceptible among the long hair of the croup and buttocks. The whole length, from the muzzle to the root of the tail, is about three feet four or five inches; the height at the shoulder is one foot seven inches, and at the croup one foot nine inches. The coloring of this species is altogether peculiar, and alone sufficient to distinguish it from all other ruminants. In general, it is a reddish fawn-color on the upper parts of the body; but this seems to be glazed, or as it were, overlaid on the shoulders, back, sides, and hips, with a light dun or silvery-brown hue, arising from the hairs in these situations being tipped with that color; the nose and legs are dark brown; the breast, belly, and interior of the fore-arms and thighs white; the hair of the forehead is long and of a deep red color. The most remarkable character of the species is the total absence of spurious hoofs, both on the fore and hind-feet, a character which exists also in the Prong-Buck, and which, as far as we are aware, no other ruminating animals of the hollow-horned family possess.

The Stein-Boc resides in pairs on the stony plains and mountain valleys of South Africa, not, however, frequenting very elevated or rocky localities, as its colonial name of Stein-Boc or *Stone-Buck* would seem to imply. On the contrary, it prefers the dry, open flats, covered here and there, it is true, with large rocks and boulder-stones, but likewise interspersed with clumps of stunted bushes and underwood, which furnish it with cover. This is the general character of the South African plains in the neighborhood of Cape Town, as well as of the gorges of the moderate hills and mountains, and it is in such situations that the Stein-Boc is most commonly found. It is remarkably shy and timid, runs with extraordinary swiftness, and when pursued will frequently bound over a space of twelve or fifteen feet at a single leap. When closely pressed, and without any further means or power of escape, it will hide its head in the first hole or corner it happens to meet with, and thus patiently resign itself to its fate. Though it cannot be called a rare animal at the Cape, it is nowhere particularly common, being much hunted on account of the delicacy of its flesh, which furnishes excellent venison, and great numbers of the young being destroyed by eagles and other birds of prey.

Colonel Smith has described the young of the Stein-Boc as a different species, by the name of *A. rufescens*, and the *A. pallida* or *A. pediotragus* of Afzelius, appears to differ in no respect from the adult of the present animal, the really distinctive characters of which have been hitherto very imperfectly reported.

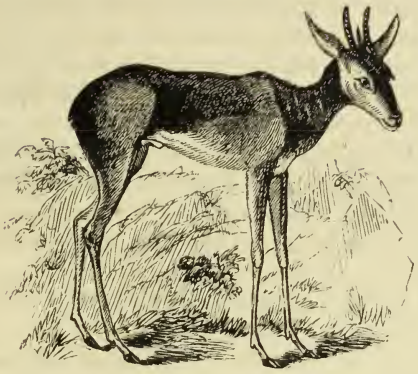
The Grys-Boc or Gray Buck, *Antilope melanotis*, is closely allied to the preceding, and has similar habits. It is found in the country around the Cape of Good Hope.

The Ourebi, or Bleek-Boc, or Pale Buck, *Antilope scoparia*, is three feet eight inches long, four feet ten inches high; the horns are awl-shaped; the general color a pale yellowish-brown above, the under parts white. It inhabits the open plains of South Africa, and without being positively gregarious, is fond of the society of its own species. It is found chiefly in the eastern districts of the Cape Colony, toward Caffraria, and its flesh, though dry and destitute of fat, is esteemed one of the best venisons of the country. Great numbers of these animals are found on the plains about Zwartkops Bay. When feeding, they straggle confusedly over the plain, and appear to be in company rather accidentally than by intention; when alarmed, also, they do not fly together, but each runs off by itself in whatever direction it thinks most secure from danger for the moment.

The Gibari, *Antilope montana*, is very like the former, but is of a gray-brown color. It is found in Abyssinia.

The Kainsi or Klippspringer, *Antilope Oreotragus*, inhabits the most barren and inaccessible mountains of the Cape, and appears to supply in South Africa the place of the Chamois and Ibex. The entire length is three feet two inches, its height twenty-one inches. The general color above is a lively and pleasant mixture of yellow and green; beneath, it is sandy-red tinged with yellow. Great numbers of the young of this species are devoured by eagles.

The *Nesotragus Moschatus* is an extremely small species; it is an inhabitant of the Island of Zanzibar as well as the neighboring coast of Mozambique.



THE MADOQUA.

The Madoqua, *Antilope Saltiana*, if we except the Pigmy Antilope, is probably the smallest of horned quadrupeds, it being two feet long and fourteen inches high. Its color is similar to that of our common gray squirrel. It lives in pairs in the mountainous districts of Abyssinia. The natives of the country object to eating its flesh, from a superstitious belief that it frequents the society of monkeys and baboons.

The Four-tufted Antilope, *Antilope quadriscopa*, is found in Senegal.

The Impoon, Duyker-Boc, or Diving-Buck, is of a yellowish-brown color, and grayish in winter. It gets its name from its habit of plunging under the bushes in its passage through the woods, instead of leaping over them like the generality of other antilopes. It is a common animal in Caffraria and in all parts of the Cape Colony. It is found alone or in pairs, makes its way readily among the thickets and low bushes, and when pursued will from time to time stand up on its hind-legs to look round it, then dive under the branches to reappear again at some distance.

This species is most probably the animal of which the female was long since imperfectly described by Grimm, and which has been admitted into systematic catalogues under the name of *Antilope Grimmia*. The *A. Platous* of Colonel Smith likewise appears to be identical with, or at most a casual variety of the Duyker-Boc, the characters upon which the separation is made being by no means constant, and some of them even of doubtful authenticity. The *Capra sylvestris—Capra Africana* of Grimm—is probably of this species.

The Black-faced Philatomba, *Antilope Campbelliæ*, differs from the Duyker by being much darker and more distinctly grizzled or dotted, and the under side being much whiter. It is possible that it is only a variety of that species.

Burchell's Bush-Boc, *Antilope Burchellii*, is easily known from the two former by its darker color, and by the under sides and inside of the legs being nearly of the same color as the back, and not white. It inhabits the districts more or less covered with underwood in Caffirland, and the country north of the Orange River. When interrupted or pursued by dogs, it springs with considerable activity over such bushes as may stand in its course, and endeavors to plunge into the closest bushes for concealment.

The Abyssinian Bush-Goat, *Antilope Madoqua*, is of a yellowish-brown color, slightly punctulated with black. It inhabits Abyssinia, and is the *Madoqua* of Bruce.

The Red-crowned Bush-Buck, *Sylvicapra coronata*, is a species found in Western Africa, and is very distinct from the last, its color being lighter, and the fur less rigid and close-pressed.

The White-backed Bush-Buck, or Bush-Goat, or Bush-Antilope, *Antilope sylvicultrix*, is about five feet in length from the muzzle to the root of the tail, three feet high at the shoulder, and three feet two inches at the croup. Its proportions are heavy and ungainly, and bear a considerable resemblance to those of the Hog-Deer of India. It inhabits the west coast of Africa, about Sierra Leone and the sources of the Pongas and Quia rivers. It frequents the thickets and underwood of the upland plains and moderate mountain declivities, keeping close to the cover

during the daytime, and quitting it only at early dawn for the purpose of feeding in the neighboring meadows. It is at this time that it is pursued by the hunters, who station themselves on the margin of the woods and shoot it as it comes out to graze. It affords excellent venison.

The Black-striped Bush-Buck, *Antilope Ogilbii*, is of a pale bay-brown color. The horns are short, thick, and conical. It is a native of Fernando Po.

The Bay Bush-Buck, *Cephalopus badius*, is very like the last species, but is of a darker bay-color; the legs are blackish, and the neck bright bay, and not blackish-bay as in the *Antilope Ogilbii*. It is a native of Sierra Leone.

The Bay Bush-Goat, *C. dorsalis*, is of a dark bay-color, with shoulders and legs darker. It is a native of Sierra Leone.

The Black Bush-Buck, *C. niger*, is a native of the coast of Guinea, distinguished by its sooty-black color.

The Natal Bush-Buck or Rhoode-Boc, *C. Natalensis*, is of a bright red-bay color, and has short conical horns. It inhabits the forests about Port Natal and the country to the eastward, living in the thick brushwood which fills up the intervals of the larger trees. It feeds on grass, the young shoots of trees, and the delicate twigs of smaller shrubs.

The Coquetoon, *C. rufilatus*, is of a deep reddish-bay color; the horns are conical, rather elongated, obscurely annulated, and slightly recurved. This is the *Grimme* of Buffon and F. Cuvier. It is a native of Western Africa.

The Guevei, *C. Maxwellii*, is of a gray-brown or sooty-black color. It is the *Royal Antilope* and *Pigmy Antilope* of Pennant and Shaw. It is a native of Senegal and Gambia.



THE KLEENE-BOC.

The Noumetzi, Cape Guevei, or Kleene-Boc, *C. pygmæa*, is about one foot high at the shoulder; the horns one and a half inch long in the male, three-quarters of an inch in the female. The color is a dark slaty-brown. It is called by the Dutch colonists of the Cape *Kleene-Boc*, *Kleene Blauw-Boc*, *Blauw-Bokje*, all signifying *Little Goat* or *Little Blue Goat*. It inhabits South Africa, and lives singly or in pairs among the bushes. It is extremely active, and of a mild and timid disposition; but from the nature of the thick bushes in which it resides is not often seen even in those districts where it most abounds. It exhibits considerable sagacity in eluding pursuit, and when domesticated soon becomes familiar, and learns to distinguish those about it and to answer to its name.

This species is the *A. cærulea* of Colonel Smith and the *A. pygmæa* of M. Desmarest, who confounds it with the Guevei.

The Black-rumped Guevei, *C. melanorheus*, is of a gray color, with the rump and upper part of the back of a black color. It is a native of Fernando Po.

The Grizzled Guevei, *C. punctulatus*, is a native of Sierra Leone, and is of a dark fulvous-brown color.

The White-Footed Guevei, *C. Whitfieldii*, is of a yellowish ash-color. It is a native of Western Africa.

The Pigmy Antilope, or Royal Antilope, or Guinea Musk, or Pigmy Musk, is of a fulvous color, and has the throat, belly, edge of the thigh, and tip of its tail, white. It is not larger than a rabbit, being only fifteen inches long and eight inches high. It inhabits Guinea, and is noted for its shyness and the speed with which it flies through the forests.



SPRING-BOC.—(See p. 540.)

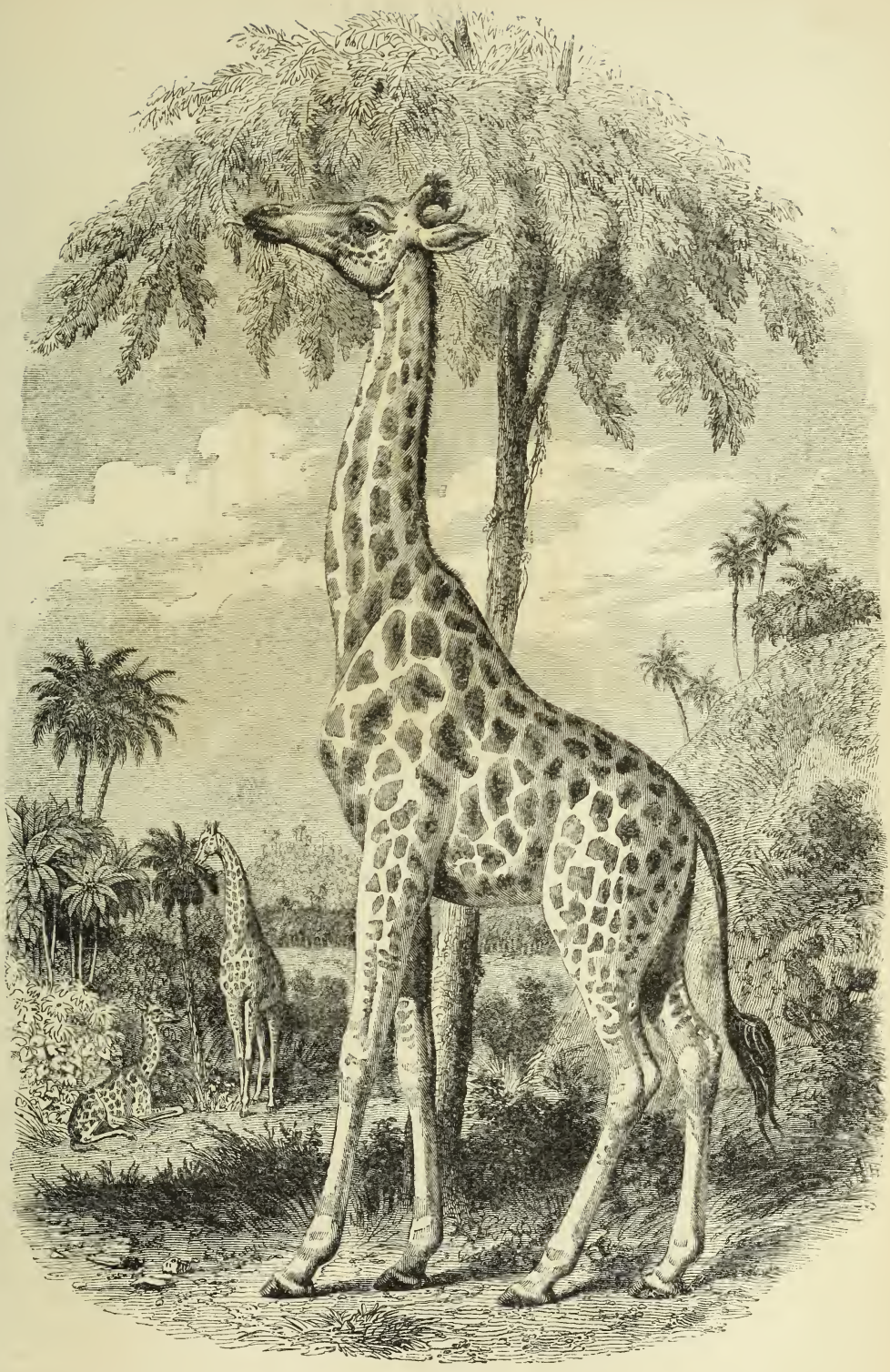


GIRAFFE.

THE GIRAFFIDÆ.

This family comprises a single genus, GIRAFFE, and a single species, the African Giraffe or Camelopard, *Camelopardalis Giraffa*. This remarkable animal is distinguished from all the other ruminants by several important characteristics. The body is short and supported upon very long legs; the dorsal line slopes downward toward the rump, the withers being greatly elevated, and from this it was long confidently asserted that the fore-legs were much longer than the hinder pair, although this is not the case. The neck is excessively long, and furnished with a short mane, running down its dorsal line; the head is comparatively small, and the countenance exceedingly gentle and pleasing in its expression, the eyes being remarkably full and lustrous. The dentition is the same as that of the deer, the upper incisors and the canines in both jaws being quite deficient. The forehead bears a pair of tapering cylindrical bony appendages, which are covered with a hairy skin like the rest of the head. These are permanent, and might be regarded as the representatives of the processes of the frontal bone upon which the deciduous antlers of the deer are developed, but they are distinct bones, only united by those of the skull, by a suture, and instead of rising exclusively from the frontal bones their broad base covers the coronal suture, so that they rest partly upon the frontal, and partly on the parietal bones. In front of the horns, the frontal and nasal bones are elevated to form a rounded protuberance which has been described as a third horn by many writers. The feet are destitute of the accessory hoofs, which occur in most of the other ruminants except the Camelidæ; and the tail is rather long, and terminated by a tuft of very long and thick hairs.

The giraffe is the tallest of all ruminants, the males not uncommonly measuring fourteen and sometimes eighteen feet from the top of the head to the ground. The females are usually a



THE GIRAFFE.

foot or two shorter. The height at the withers is about ten feet in large animals, while the length of the body, from the breast to the rump, is not more than six or seven. The ground color of the skin is yellowish, but it is covered with large spots and patches of lighter and darker brown, which give it a very elegant appearance. It is a native of the eastern parts of Africa, from the Cape northward as far as Nubia. It lives in small herds upon the plains, always in the neighborhood of woods, as it feeds almost entirely upon the tender shoots and leaves of trees, which the great length of its neck enables it to reach with ease. The tongue also is very extensible, and is employed as a prehensile organ, and the large, free lips can be used in the same way.

The giraffe is not a very swift animal, and when pursued its gallop is described as exceedingly ludicrous, the hind-legs being brought forward at each step completely in advance of the anterior ones, apparently a foot or two on the outside of them; in this fashion the giraffes contrive to get over the ground pretty rapidly, with a curious springing motion. They are easily overtaken by a good horse, and the rider may then select his victim from the herd, cut it off from its companions, and shoot it at his leisure. When going at full speed the heels of the giraffe constantly throw up dirt, sticks, and stones in the faces of its nearest pursuers, but it never appears to attempt to defend itself unless brought to bay; in this case its weapons are its hoofs, with which it kicks out so rapidly and vigorously that dogs will not venture to attack it, and it is even said that it can beat off the lion in the same manner. The flesh of these animals, when young, is considered very good; that of the old ones is coarse. The skin is very thick and highly valued by the natives of South Africa, who consider the leather formed from it to be the best material for sandal soles. They also use the skin in the formation of vessels to hold water, and sometimes as a covering for their huts.

Cumming gives us the following lively description of the giraffe, at liberty in his native regions: "These gigantic and exquisitely beautiful animals, which are admirably formed by nature to adorn the forests that clothe the boundless plains of the interior, are widely distributed throughout the interior of Southern Africa, but are nowhere to be met with in great numbers. In countries unmolested by the intrusive foot of man, the giraffe is found generally in herds varying from twelve to sixteen; but I have not unfrequently met with herds containing thirty individuals, and on one occasion I counted forty together; this, however, was owing to chance, and about sixteen may be reckoned as the average number of a herd. These herds are composed of giraffes of various sizes, from the young giraffe of nine or ten feet in height, to the dark chestnut-colored old bull of the herd, whose exalted head towers above his companions, generally attaining to a height of upward of eighteen feet. The females are of lower stature, and more delicately framed than the males, the height of the latter averaging from sixteen to seventeen feet. Some writers have discovered ugliness and a want of grace in the giraffe, but I consider that he is one of the most strikingly beautiful animals in the creation; and when a herd of them is seen scattered through a grove of the picturesque parasol-topped acacias which adorn their native plains, and on whose uppermost shoots they are enabled to browse by the colossal height with which nature has so admirably endowed them, he must, indeed, be slow of conception who fails to discover both grace and dignity in all their movements. There can be no doubt that every animal is seen to the greatest advantage in the haunts which nature destined him to adorn, and among the various living creatures which beautify creation I have often traced a remarkable resemblance between the animal and the general appearance of the locality in which it is found.

"In the case of the giraffe, which is invariably met with among venerable forests, where innumerable blasted and weather-beaten trunks and stems occur, I have repeatedly been in doubt as to the presence of them, until I had recourse to my spy-glass; and on referring the case to my savage attendants I have known even their optics to fail, at one time mistaking these dilapidated trunks for camelopards, and again confounding real camelopards with these aged veterans of the forest."

Several giraffes have lived for some years in the London Zoological Gardens and the Garden of Plants at Paris. They have even bred several times, and the young animals have thriven admirably. The female goes with young about fourteen months, and produces a single young one at a birth; this, when born, measures nearly six feet from the head to the root of the tail.



THE CERVIDÆ.

These, the animals of the somewhat numerous and diversified Deer Family, are distinguished principally by the peculiar nature of the horns or antlers, which, with but a single exception, that of the reindeer, are possessed only by the males. Unlike the horns of the ox, goat, sheep, and antilope, the antlers of the deer are deciduous—that is to say, they are cast every year after the breeding season, and again renewed before that period of excitement returns. They are produced upon a pair of processes of the frontal bone, by an action analogous to that by which injuries to the bones are repaired. The process forming the base of the horn is covered by a skin, beneath which a sort of inflammation is set up; this produces cartilaginous matter, which increases rapidly in amount, gradually becomes ossified, and finally forms the horn, which, when mature, is still covered by the vascular skin beneath which it has been formed. This however, dries up and peels off soon after the complete development of the organs, and the latter then consist of bare bone. The antlers are sometimes small, but generally of comparatively large size, and very variously branched; their size and the number of branches usually increase with age, and the old males of several species are adorned with a most enormous pair of spreading horns.

Beneath each eye, in almost all the species, there is a cavity called the *lachrymal sinus*, which the animal is able to open at pleasure, and which secretes a thick waxy fluid of a disagreeable odor. The metatarsus is also usually furnished with one or two glands, covered with a small tuft of hair; the presence of these furnishes a good character for distinguishing the hornless females of this family from those of such antilopes as are also destitute of horns. They are deficient only in the Muntjacs—a small group of Oriental deer forming the genus *Cervalus*.



THE REINDEER.

The species of cervidæ are not very numerous, but distributed in all parts of the world. By some zoologists they are considered as forming only a single genus, while others divide them into several generic groups, characterized principally by differences in the conformation of the antlers.

Genus REINDEER: *Tarandus*.—Of this there is but one species, the RHENDEER or REINDEER, *T. rangifer*, the only one of the deer family which has been fully and permanently domesticated, though there are several marked varieties. They are all confined to the high northern regions of Europe, Asia, and America.

The most noted variety is that of the eastern continent, to which the domesticated breeds of Lapland belong. The hair of the wild ones in winter is long, thick, and gray-brown; neck, rump, belly, ring round the hoof, and end of nose, white. In summer it is short, dark sooty-brown, with the parts which are white in winter rather pale gray-brown. The tame animal is about four and a half feet long and three feet high. On casting its coat it is at first brownish-yellow, but as the dog-days approach it becomes whiter, till it is at last almost entirely white. Round the eye the color is always black. The longest hair is under the neck; the mouth, tail, and parts near the latter are white, and the feet, at the insertion of the hoof, are surrounded with a white ring. The hair of the body is so thick that the skin cannot be seen when it is put aside, for it stands erect, as in other animals of the same genus, but is much thicker. When the hair is cast it does not come away with the root, but breaks at the base. The fawns are generally brown on the upper part and reddish beneath. This is the common appearance of the domestic reindeer, but it must be understood that it is subject to great variety of color.

Though there is some diversity in the form of the horns, it may be said generally, as to all the varieties, that they are cylindrical, with a short branch behind, compressed at the top and palmated with many segments, beginning to curve back in the middle. A single branch sometimes, but seldom two, springs from each horn in front, very near the base, frequently equaling the length of the head, compressed at the top and branched. The distance between the tips equals the length. The horns of the female are like those of the male, but smaller, more slender, and not so much branched. She has four true mammæ, and two false ones. The horns grow in the usual manner, and during the early part of their growth are extremely sensible, and suffer from the clouds of gnats—*Culex pipiens*—that form one of the persecutions of both deer and owner. About autumn they have become hard, and the velvet which covers them is rubbed off. Toward the end of November the male loses his horns, but the female retains hers till she brings forth; if barren, she drops them in the beginning of November.

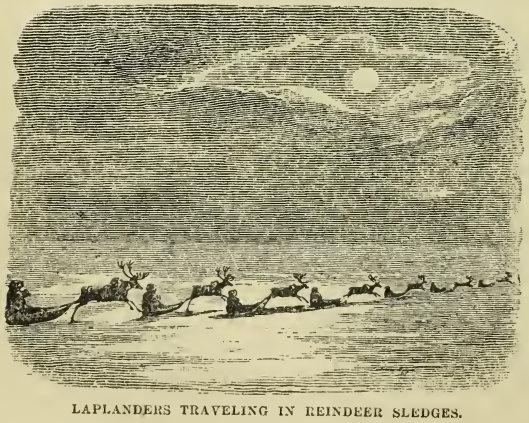
The wild reindeer exists in Norway, Sweden, Lapland, and also in the islands of Spitzbergen and Nova Zembla. In summer they seek the high mountain lands, which are often covered with snow even in summer, chiefly to avoid the gnats which torment them; in winter they descend to the lower country. At this season they live chiefly on a kind of white moss which hangs in festoons from the trees, though they also eat the twigs of trees. These animals unite in herds to migrate. Many are killed by hunters in autumn, when they are fat. Sometimes the flesh is preserved by salting, and sometimes by drying and smoking. The Laplander, whose country is too cold and barren for cultivation, except to a very limited extent, has domesticated this animal, and it is as necessary to him as the camel is to the Arab of the desert. Indeed, Lapland would be uninhabitable but for the reindeer. The wealth of the people of this country is computed from the number of their herds. Some of them possess more than a thousand, many several hundreds. In the summer these animals are pastured in the mountains, where they feed upon ordinary herbage; at the approach of winter they are driven down into the plains, and their food at this season consists principally of moss, which they dig up from beneath the snow by means of their hoofs, and often by rooting for it like hogs. When going on a journey, the Laplanders take a supply of this lichen with them, and four pounds of it are said to be sufficient for a day; in some cases, however, the animals will travel for two or three days without food, without seeming to feel the want of it.



MILKING THE REINDEER.



LAPLANDERS MIGRATING.



LAPLANDERS TRAVELING IN REINDEER SLEDGES.

The main necessities as well as comforts of life are supplied to the Laplander by his reindeer. The flesh of the animal is the most substantial part of his food, and its milk serves him in various ways. It is drunk; it is coagulated into cheese; the whey is used for drink, and in some instances fermented and distilled into a liquor analogous to that which the Tartars make from the milk of the mare. The skin of the reindeer, which is warm, strong, and pliant, serves for clothing, for blankets, for covering the sledge, and for almost every purpose to which we apply cloth or leather. The tendons, which are very tough, furnish thread; the horns are manufactured into a variety of domestic utensils; and even the intestines of the animal have their domestic uses, while the tongues, which are considered luxuries

in most countries, give even the poor Laplander an export trade, and make him a citizen of the world. As a beast of burden or draught the importance of the Reindeer is equally great. The weight which it can draw over the snow, when harnessed to a sledge, is said to be three hundred pounds, but two hundred and forty pounds form the general limit. The tales told of its swiftness, when thus employed, would appear almost incredible if not well attested. In a race of three deer with light sledges started by Pictet, who went to the north of Lapland in 1769 to observe the transit of Venus, the first performed 3089 feet in two minutes, making a rate of nearly nineteen English miles an hour; the second went over the same ground in three minutes, and the last in three minutes twenty-six seconds. One is recorded to have drawn an officer with important dispatches, in 1699, eight hundred English miles in forty-eight hours, and the portrait of the poor deer, which fell dead at the end of its wonderful journey, is still preserved in the palace of Drotningholm in Sweden. Journeys of one hundred and fifty miles in nineteen hours are said not to be uncommon.

In America the Reindeer is called Caribou, and is usually described as consisting of two varieties. These chiefly inhabit the high northern territories called Fur Countries: one is named the Woodland Caribou, and is confined to the wooded and more southern districts; the other, called the Barren Ground Caribou, passes the summer along the shores of the Arctic Seas or the Barren Grounds of the north, and retires to the woods only in winter. The former is the larger animal, being about the size of the Lapland breed, and weighing two hundred to two hundred and forty pounds, while the latter weighs about one hundred to one hundred and thirty pounds. The difference of size seems to constitute the chief difference between the two varieties; both are of a deep brown color in summer, and a grayish-white in winter. Both migrate in herds of from twenty to two hundred, and both are hunted by the Indians and Esquimaux, who value their hides, and who esteem their tongues a great luxury. The flesh is also an important article of food, and is made into *pemmican* by being pounded and then mixed with one-third of melted fat poured over it; it will keep a great length of time, and is much used by hunters and travelers. Other varieties are spoken of, as the Rocky Mountain Caribou and the Newfoundland Caribou, but there is probably no foundation for such distinctions. It is, indeed, doubted by some naturalists whether there are any such permanent varieties as we have described under the names of *Woodland* and *Barren Ground Caribou*. One or both of these are widely spread, extending from Canada north to the Arctic seas and west to the Pacific. Baird inclines to regard the latter as a distinct species.

Genus ELK or MOOSE: *Alces*.—Of this there is a single species, called Elk in Europe, and Moose or Moose-Deer in the United States. It is the *A. malchis* of naturalists; *Cervus Alces* of Linnæus; the *Eland* and *Orignal* of Buffon; the *Elch* of the Germans, and *Loss* of the Russians. It was formerly common in all the north of Europe and Asia, but is now rarely met with, and only in the extreme northern regions. When the United States were first settled by the whites, it extended from the Carolinas to the polar regions; its southern limit now is the northern borders of Maine and New York. Thence northward to the arctic seas it is found more or less abundantly.

This animal is the largest of the deer kind, being taller than the horse. Its horns weigh fifty or sixty pounds, and the whole carcass seven hundred to twelve hundred pounds. The head, measuring above two feet in length, is narrow and clumsily shaped by the swelling upon the upper part of the nose and nostrils; the eye is proportionally small and sunk; the ears long, hairy, and asinine; the neck and withers are surmounted by a heavy mane, and the throat furnished with long coarse hair, and in younger specimens encumbered with a pendulous gland; these give altogether an uncouth character to this part of the animal. Its body, however, is round, compact, and short; the tail not more than four inches long, and the legs, though very long, are remarkably clean and firm; this length of limbs and the overhanging lips have caused the ancients to fancy that it grazed walking backward. The hair of the animal, which is of a grayish-brown, is coarse and angular, breaking if bent. Its movements are rather heavy, and the shoulders being higher than the croup it does not gallop, but shuffles or ambles along, its joints cracking at every step with a sound heard to some distance. Increasing its speed, the hind-feet straddle to avoid



THE ELK OR MOOSE.

treading on its fore-heels, tossing the head and shoulders like a horse about to break from a trot to a gallop. It does not leap, but steps without effort over a fallen tree, a gate, or a rail-fence. During its progress it holds the nose up so as to lay the horns horizontally back. This attitude prevents its seeing the ground distinctly, and as the weight is carried very high upon its elevated legs, it is said sometimes to trip by treading on its fore-heels, and occasionally to give itself a heavy fall. It is probably owing to this occurrence that the Elk was believed by the ancients and the vulgar to have frequent attacks of epilepsy, and to be obliged to smell its hoof before it could recover; hence the Teutonic name of *Elend—miserable*—and the reputation, especially of the fore-hoofs, as a specific against the disease.

From this description it might seem that the Moose was an uncouth and unsightly animal, and so it is when seen in a menagerie, or stuffed, in a museum; but seen dashing through its native forests, it is said to produce on the mind of the beholder a feeling of beauty and sublimity.

During the winter months the Elk resides chiefly in hilly woods, in snowy weather seeking the covers, and in clear the open spaces. In summer it frequents swamps on the borders of lakes, often going deep into the water to escape the sting of gnats, and to feed without stooping. Its usual food in winter consists of the buds and bark of button-wood, spruce, and juniper-pines, birch and maple, and under the snow it seeks mosses, but this is always with difficulty, for then it is obliged to spread the fore-legs, or even, it is said, to kneel. The branches of trees it turns down with the horns very dexterously. It is a long-lived animal, and does not attain its full growth till fourteen years of age. The female has no horns; her period of gestation is nine months, and she produces from one to three at a birth about the middle of May. In summer and autumn the Elk is seen in small herds; in winter he is often alone or in company of two or three. His flesh is excellent, and is seen every winter in the markets of New York and Boston. The skin is used for various kinds of covering.

This animal has been sometimes domesticated in Europe, and has even been taught to draw sledges in Sweden. In the United States it is only known as a wild animal, extremely timorous, and flying with terror from man. It was formerly much hunted by the Indians, and constituted a large part of their food; it is now more rare, but is still occasionally pursued, and the chase—

leading as it does into the deepest wilds and often over mountains and streams—is regarded as a peculiarly exciting and inspiring kind of sport.

Genus CERVUS: *Cervus.*—This includes a very large number of species, the greater part, indeed, of the animals which go under the general name of *Deer*, and which are divided into several genera by some naturalists.



THE AMERICAN ELK, OR WAPITI.

The American Elk or Wapiti, *C. Canadensis—Elaphus Canadensis* of De Kay—is a large and noble species, resembling the red deer of Europe; it has tall, round, branching horns, sometimes six feet high; the color is yellowish-brown; the tail short, the form stately, the air majestic. Its length is seven to eight feet, its height four and a half to five. Its horns are shed in February or March. This animal is common in the Northwestern States, and thence north to Lake Winnipeg, the herds consisting of from fifty to one hundred. It is a good deal hunted by the Indians, though the flesh is coarse; the skins are much prized. It has been partially domesticated and breeds readily in confinement.

The Stag or Red Deer, *C. elaphus*—the *Cerf* of the French; *Cervio* of the Italians; *Hirtz* of the Germans;—is The Deer *par excellence* of England in all works on "the noble art of venerie," and in all allusions to the bold foresters of "merry old England." The male is called a *hart* and the female a *hind*. The horns of the male are lofty and branching, the female being destitute of these ornaments. In summer the color is yellowish-brown; in winter it is reddish-brown. The young fawns are of a rich yellowish-brown, dappled with white spots, and it is from their ground color that dyers give the name of *fawn* to a peculiar shade of color intermediate between brown and yellow. The color deepens much with age, so that in winter the old stags are nearly black. The average height of the Stag is three feet and a half; the weight from one hundred and fifty to three hundred pounds. This animal, which was once abundant over the greater part of Europe and Asia, like the Elk is now confined to the northern forests, and is nowhere common. Formerly abundant in Great Britain, it is now only known in Scotland, where it is hunted with hounds, and brought down with the rifle. It figures in all descriptions of the manners and cus-



WAITING FOR THE HERD.

toms of these countries during the Middle Ages, and even at a later period. A stag hunt was indeed the grandest sport of the higher gentry, and far surpassed in excitement the modern chase of the fox. Scott's description, at the opening of the "Lady of the Lake," is equally beautiful and true:

"The stag, at eve, had drunk his fill,
While danced the moon on Monan's rill,
And deep his midnight lair had made
In lone Glenartney's hazel shade;
But, ere the sun his beacon red
Had kindled on Ben-Voirlich's head,
The deep-mouthed bloodhounds' heavy bay,
Resounded up the rocky way,
And faint, from farther distance borne,
The echo of the hoof and horn.
Yelled on the view the opening pack,
Rock, glen, and cavern paid them back.
To many a mingled sound at once
The awaken'd mountain gave response:
A hundred dogs bayed deep and strong,
Clattered a hundred steeds along;
Their peals the merry horns rung out,
A hundred voices joined the shout;
With whoop! and hark! and wild halloo!
No rest Ben-Voirlich's echoes knew.
Far from the tumult fled the roe;
Close in her covert cower'd the doe;
The falcon from her cairn on high,
Cast on the rout a wondering eye,
Till, far beyond her piercing ken,
The hurricane had swept the glen."



RED DEER.

The *C. Corsicus* is a small variety of red deer found in Corsica.

The Barbary Deer, *C. Barbarus*, is chiefly distinguished from the common stag, and the Algerian variety of it, by its smaller size, stouter form, and more permanently spotted fur. It is the *Bush-Goat* of the Moors, and inhabits the coasts of Barbary.

The Bara Singa or Morl, *C. Wallichii*, is an Indian species. It is also found in Persia, where it is called *Maral*, *Gevezu*, or *Gookoohee*. It is the *Cervus Pygargus* of Hardwicke; also the *Jesrael* or *Tailless Deer* and *Red Deer* of India.

The Saul-Forest Stag, *C. affinis*, is the *Stroa* or *Tibetan Stag* of Hodgson, the *Bara Singa* of the Hindoos. The bones are as heavy and as large as those of the Wapiti.

The Sika, *C. Sika*, is of a dark-brown color, and has rather slender horns. It is a native of Japan.



THE COMMON DEER OF EUROPE.

The Common Deer of Europe, or Fallow-Deer, *Dama vulgaris*—the *Daim* of the French; the *Damhirsch* of the Germans—is smaller, feebler, and more common-place in its character than the red deer. It closely resembles our common deer. In summer both sexes have the back, flanks, and thighs of a fulvous-brown color, diversified with numerous white spots. In winter these parts are wholly brown; the haunches are always white. The general form is light, and the movements elegant. In various parts of Europe they are found wild, living in considerable flocks; they are also met with in a half-domesticated state in the parks of wealthy proprietors. This is especially the case in England, where the herds of Fallow-Deer, variously colored and marked, are a pleasing ornament of the rich lawns which spread before the castles and country-seats of that country. There are many varieties of this species, some being brown, some spotted, and some milk-white. It is represented on the sculptures of Nineveh.

The Sungnai, *Panolia Eldii*, is an Indian species of Deer.

The Bahrainga, *Rucervus Duvaucellii*, is another Indian species. It is called the *Spotted Deer* of the Sunderbunds, and *Barara Singha*, by Hardwicke. It is the *Cervus Elaphoides* of Hodg-

son. It inhabits reedy marshes and the islands of large rivers, never entering the mountains or forests. The tail is short, with no caudal disc and no heavy mane.

The Samboo, *Rusa Aristotelis*, is the *Cervus hippelaphus* of Ogilby, *Cervus unicolor* of H. Smith, *Cerf de Coromandel* of Cuvier, *Cervus Bengalensis* of Schirz, *Daim Noir de Bengale* of Duvaucell, the *Samboo-Deer* of Bennett, *Cervus heterocerus* of Hodgson. The last author describes four varieties of this animal. They are natives of various parts of India, and inhabit great forests and the mountains above them. They are not gregarious, and pair and drop their horns in spring.

The Spotted Rusa, Gerver or Gower, *Rusa Dimorphe*, is red-brown.

The Samboe, *R. equinus*, is the *Rusa* of Raffles; the Eland or *Elk* of the Dutch sportsmen. It inhabits Sumatra and Borneo, and is of a plain brown color.

The Smaller Rusa, *R. Peronii*, is a native of Timor and Luboc, Bavian and Ternate.

The Philippine Rusa, *R. Philippinus*, is the *C. Marianus* of Cuvier, and is a native of the Philippines.

The Sundevall Rusa, *R. lepida*, is a native of Java. It is scarcely as large as a roebuck.

The Mijangan Banjoe, *R. hippelaphus*, is the *Cervus hippelaphus* of Cuvier. Its size and proportions are those of the stag, but its hair is rougher and harder, and when adult that of the upper part of the neck, of the cheeks, and of the throat is long, and forms a sort of beard and mane. In winter its color is of a grayish-brown more or less deep; in summer it is of a brighter and more golden brown. It is a native of Bengal, Sumatra, and the islands of the Indian Archipelago.



THE AXIS DEER.

The Axis, *Axis maculata*, is the *Axis* of Pliny; *Cerf Cochon* of Buffon. In size and general form it nearly resembles the common fallow-deer. The skin is at all times of a rich fawn-color spotted with white. The young resemble the parents. It is a native of India and the larger islands of the Indian Archipelago; very abundant in Bengal, and on the banks of the Ganges. It haunts the thick jungles in the vicinity of water, and the British sportsmen hunt it under the name of the *Spotted Hog-Deer*. It feeds in the night; and is timid, indolent, and mild, excepting when the females have young, and then the male is bold and fierce. It is easily domesticated, and in England has propagated freely in captivity. The species has been kept with success both in menageries and open parks, to both of which its form and color make it an elegant ornament.



THE TAME FAWN.



THE GUEMUL.

The Spotted Axis, *A. pseudaxis*, is the *C. pseudaxis* of Gervais. It differs from the *A. maculata* in having a series of spots in place of an oblique streak on the haunches.

The Lugna Para or Shgoriah, *Hyelaphus porcinus*, is easily distinguished from the Axis by being lower on its legs, and having no distinct black dorsal streak, nor white streak on its haunches. The horns are generally short, with only short snags. They live in families, or small herds, in the plains of Hindostan. They are also found in Ceylon.

The *C. Dodur* of Royle is probably a distinct species; the *C. pumilis* of H. Smith is perhaps a variety.

The Roebuck, *C. capreolus*, the *Chevreuil* of the French, *Rehbock* of the Germans, is a small species of deer, once common all over Europe, but now rare, though still found in small numbers in England and Scotland, and more abundantly in France, Italy, and the northern parts of Europe. It lives in families, feeds on herbage and the tender shoots of underwood, is of a grayish-brown color tinged with fawn, and whitish on the haunches. It weighs fifty to sixty pounds; its flesh is delicate food, and the horns are much used for the handles of carving-knives, &c.

The Ahu, *C. Pygargus*, the *Cervus Pygargus* of Pallas, *Cervus Ahu* of Griffith, the *Siaga* of the Tartars, *Dikaja Kosa* of the Russians, *Tailless Roe* and *Tailless Deer* of Pennant and Shaw, is a native of Central Asia.

The Guazupuco, *Blastocerus paludosus*, is the *Cervus Mexicanus* of Goldfuss, *C. dichotomus* of Illiger, and is a native of South America.

The Mazame or Guazuti, *B. campestris*, is the *Cervus bezoarticus* of Linnæus, *C. campestris* of F. Cuvier, the *Biche des Pampas* of Cuvier. It is a native of South America in Northern Patagonia; is exceedingly abundant, in small herds, throughout the countries bordering the La Plata. Mr. Darwin describes the odor of the buck as quite overpowering, from its disagreeable character.

The Tarush or Taruga, *Furcifer Antisiensis*, is a native of South America, in the Bolivian Alps.

The Guemul, *F. Huamel*, is the *Cloven-footed Horse* of Shaw. It is a native of the east coast of South America.

The Mexican Deer, *C. Mexicanus*, inhabits Mexico, but is little known.



THE COMMON AMERICAN DEER.

The Common American Deer, *C. Virginianus*, called by European writers by the various names of *Roebuck*, *Jumping Deer*, *Long-tailed Deer*, &c., is about the size of the European fallow-deer, and resembles it in temper and character; the color is brown in summer and gray-brown in winter; the fawns are spotted with white; the tail is white beneath, and carried erect when running; the length of the body is five feet to five and a half; the height three to three



FEMALE AMERICAN DEER, IN THE ZOOLOGICAL GARDENS, LONDON.

and a half; the weight one hundred and twenty to two hundred pounds. In its form it is light and elegant, and in its movements exceedingly graceful. Its flesh is delicious, and its venison is one of the luxuries of the table in winter throughout a great part of the United States. It is very timid, and flies with almost incredible speed from the hunter, bounding through the thick mazes of the forests almost as swiftly as over the open plains. There are few objects in nature



THE MULE DEER.

more beautiful than this animal, whether grazing at its ease, or flying in fear amid its native wilds. Its food varies with the season: in winter it consists of the buds of various shrubs; in spring and summer of tender grasses. It sometimes tastes the young wheat, oats, field-peas and Indian corn of the border plantations, as well as huckleberries, blackberries, and the like. The young are produced in May. These animals are naturally gregarious, and are found in immense herds on the western prairies, the males, however, being apart, except at the season of intercourse. At this time the bucks have fearful battles, and sometimes their horns become interlocked and both perish. In general these animals are silent, though the males sometimes utter a snort or shrill whistle, and the fawns have a faint and touching bleat. The does also bleat when wounded, like a calf in distress. They take to the water freely and swim with considerable speed. Formerly this species was common over the whole country; at the present time it is rare in New England, except in particular localities. In the Alleghany Mountains and their slopes, from Northern New York even to Georgia, it is still common. It is also found in all the wooded parts of the Southern States. In Texas and Mexico it is abundant. It exists sparingly in Upper Canada, and is sometimes, though rarely, met with in Oregon and California. Various modes of hunting it by both whites and Indians are adopted, and it is no doubt everywhere rapidly diminishing.

The Mule Deer, *C. macrotis*, is between the common deer and the American elk in size. Its horns are round and twice forked; the body above is brownish-gray; the tail ash-color above, black near the tip; belly grayish-white; hair coarse like that of the elk; the ears long, giving name to the species from their resemblance to those of the mule. It seeks the remote, solitary wilds, far from human settlements, and appears to be mostly confined to the eastern slopes of the Rocky Mountains, from latitude 54° north to 30° south. It chooses for its haunts rocky hills covered with firs.

The Black-Tailed Deer, *C. Richardsonii*, or *C. Lewisii*, is a fine species, a trifle larger than



THE MUNTJAC.

the common deer, but smaller than the mule deer; first noticed by Lewis and Clark, and now found in considerable numbers in California and Oregon, where it seems to take the place of the common deer. The color is reddish-brown above and white beneath; the horns are cylindrical and twice bifurcated. When the gold-hunters of California first resorted to that region this species was a considerable resource; as gold was more abundant than food, a single buck was sometimes sold for eighty dollars.

The Long-tailed Deer, *C. leucurus*, is the smallest of the American deer, but having a tail sometimes seventeen inches long. In general appearance it resembles the Virginia deer. It is common on the Columbia River.

The Californian Roe, *C. punctulatus*. Dr. J. E. Gray says, "There is a female of this species in the Zoological Gardens; it is much smaller and darker than the *C Virginianus*, and it differs in the hair being dark, with a distinct, yellow subterminal band." It is scarcely necessary to say that there is no species of this name in any part of this country: this specimen may be of the preceding species.

Genus CERVULUS: *Cervulus.*—Of this there are several species. The Kijang or Muntjak, *Cervulus vaginalis*—the *Cervus muntjac* of Zimmerman; the *Ribbed-Faced Deer* of Pennant; *Chevreuil des Indes* of Allamand—is about two feet two inches high; the head pointed; eyes large; ears rather large; tail short and flattened. It selects for its retreat certain districts, to which it forms a peculiar attachment, and which it never voluntarily deserts. Many of these are known as its favorite resort for several generations. It is occasionally found partially domesticated in the inclosures of natives and Europeans, but requires a considerable range to live comfortably; it is cleanly in its habits, and delicate in its choice of food. The flesh affords an excellent venison, which is often found on the tables of Europeans. The natives eat the males, and always present them in a conspicuous place in their feasts; but in consequence of some peculiarities in the habits of the females, they have an aversion to them as food. They are found in India and Java.

The Kegan or Kakr, *C. moschatus*, is the *Cervus Moschus* of Desmarest; the *Musk-Deer* of Nepaul; the *Jungle Sheep*. It is of a bright reddish-yellow color, with the chin and gullet whitish. It is a native of India, where it lives in forests on the mountains, six or eight together.

The Chinese Muntjak, *C. Reevesii*, is of a grayish-brown color, with short, pale, ringed hair. It is a native of China. Dr. J. E. Gray says, "The Earl of Derby has three kinds of these at Knowsley, but they breed together, and it has hence become impossible to discriminate the males from the original species."

The Cariacou Deer, *C. nemoralis*, is the *Cerf Blanc* or *Cerf des Paletuviers* of Cuvier; *Chevreuil d'Amérique* of Daubenton; *Biche des Savannes* of Buffon, and is a native of the shores of the Mexican Gulf and of Guiana.



THE GAUZU-VIVA

The Gauzu-Viva, *Coassus nemorivagus*, is a delicate little deer, only twenty-six inches in length. Its aspect is said to resemble that of the sheep; the general color is brownish, approaching to gray, each hair being tipped with white. The horns are short. It is a native of the Brazils.

The Cuguacu-Ete or Pita, *C. rufus*, is the *Cervus rufus* of F. Cuvier. Its height is about twenty-nine inches; general color reddish-brown; the females without horns. It lives in the low, moist woods of South America, in large herds, and as ten females are seen for one male, it is supposed that their appearance gave currency to the report of a form of deer on the new continent without horns. They are very fleet, but only for the first start, for they are soon run down by dogs, and are sometimes captured by the lasso and balls.

The Eye-browed Brocket, *C. superciliaris*, differs chiefly from the two last in the form of the muffle, and in the presence of a white streak over the eyes. It is a native of the Brazils.

The Large-eared Brocket, *C. auritus*, is also a native of the Brazils.

The Venada, *Pudu humilis*, is the *Mazame* of Hernandez, and is a native of Chili.

Fossil Deer.—The remains of several kinds of deer, including existing as well as extinct species, have been found in great numbers in Great Britain, France, Italy, Spain, India, &c. Lyell regards the abundance of fossil remains of various animals to be in the following order: first, the *deer*, then the *ox*, *boar*, *horse*, *dog*, *hare*, *fox*, *wolf*, *cat*, and *beaver*, the last being very rare. In Ireland, Scotland, and the Isle of Man the bones of an extinct gigantic elk, surpassing even the wapiti and moose in size, have been found. The antlers were over five feet long, and had a spread of ten feet at the tips. This enormous animal is named *Megaceros Hibernicus*, and is referred to the period of the Mammoth.

THE MOSCHIDÆ.

This family includes several species, bearing the general name of *Musk-Deer*, though only one, the *Thibet Musk*, produces the drug called *Musk*. These animals are denominated *Chevrotains* by the French.

Genus MUSK or CHEVROTAIN: *Moschus*.—This includes several species. The Musk or Thibet Musk, *M. moschiferus*, resembles the roebuck in size and form; the color is a rusty-gray, in some cases wavy; the female less than the male; the young spotted. It is a shy, solitary animal, much hunted for its *musk*,* which is contained in a kidney-shaped, pendulous bag of the

* *Musk* is of two kinds, and received from two sources: the *Tonquin Musk*, or *Thibet Musk*, chiefly received in England through the East India Company, comes in small, oblong, rectangular boxes, lined with lead, and covered with paper or silk. Each bag or pod, as it is termed, is wrapped in thin blue or red paper, on which are marked some Chinese characters. The *Kabardin, Russian*, or *Siberian Musk* is either received through St. Petersburg or, it is said, sent to China, and laid for some time among the bags of genuine Tonquin Musk, to acquire the odor of the



THE MUSK DEER.

size of a hen's egg, situated below the abdomen, and peculiar to the male. It is brown and unctuous, and may be pressed out through two apertures. It is the strongest and most pungent of perfumes; the mere skin of the animal is sufficient to fill the place where it has been kept with a strong odor for a long time. In medicine it is used as an antispasmodic. The flesh of the animal, though that of the male is rather highly seasoned with musk, is still eaten. The Musk-Deer



MUSK BAG.

is a native of Thibet, the province of Mohang Meng, in China, Tonquin, Bootan, &c. There are three other species: the Siberian Musk or Kubaya, *Moschus Sibiricus;* the White-bellied Musk, *M. leucogaster.* found in Nepaul, and the Golden-eyed Musk, *M. chrysogaster*, also found in Nepaul.

Genus TRAGULUS: *Tragulus.*—Of this there are several species, all of small size. The Meminna, *T. Meminna*, is an exceedingly minute species, only about seventeen inches long; the color is a gray-olive above and white below; sides and haunches spotted, and barred with white; weight, five to six pounds. It is a native of India, Ceylon, and Java. It is called *Peesoreh* by the Mahrattas.

Stanley's Tragule, *T. Stanleyanus*, is found in Ceylon. Four living specimens of it were in 1836 in the collection of the Earl of Derby at Knowsley.

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latter, and then shipped to Europe. The pods of this sort are in general larger, more oval, more compressed, and the margins often have large portions of the skin of the abdomen attached to them. The color of the hairs is a dirty milk-white. The musk exhibits a more homogeneous and less granular appearance, having a much fainter odor and taste than the preceding kind. The odor is augmented by moisture, but is somewhat nauseous and disagreeable.



THE KANCHIL.

The KANCHIL, *Moschus Kanchil*, or *Tragulus pygmæus*—the *Javan Chevrotain* of Buffon—is of a brownish fawn-color, and about the size of a hare.

The NAPU, *T. Javanicus*, is two feet long and nine inches high; the eyes are large and brilliant; the tail short; the general color brownish-gray. It frequents thickets near the sea-shore, and feeds principally upon berries. It seldom visits the larger forests, which are the favorite resort of the Kanchil, for it does not possess either the agility or the cunning of the latter, to secure it from danger, and prefers, therefore, the vicinity of man, with whom it readily becomes familiar,



THE NAPU MUSK DEER.

to that of the beasts of prey which inhabit the interior. When taken young it is tamed with the greatest facility. In captivity it appears perfectly at its ease, and quite indifferent to what is passing around it. Its full, dark eye and placid air give it the appearance of a degree of intelligence which it does not really possess, for the greater part of its existence is passed in eating, drinking, and sleeping. Its voice is scarcely more than might be produced by a deep but still a gentle expiration. It is found in Java and Sumatra.

Genus HYEMOSCHUS: *Hyemoschus.*—Of this there is a single species, the BOOMORAH, *H. aquaticus*, found in Western Africa living in marshy situations. It is of a brownish-fawn above and white beneath. In size it resembles the preceding. It has excited an interest among zoologists from a peculiar resemblance in the formation of its feet to those of the hog.

FOSSIL MOSCHIDÆ.—The fossil bones of several species of Musk-Deer have been found in India.



THE BACTRIAN CAMEL.

THE CAMELIDÆ.

This family includes two genera, the *Camel* and the *Lama*, both of which are in several respects very unlike the other members of the order of Ruminantia, and at the same time very unlike each other. Both, however, are among the most useful of animals to the inhabitants of the countries they inhabit.

Genus CAMEL: *Camelus.*—Of this there are two species, the BACTRIAN CAMEL, *C. Bactrianus*, and the DROMEDARY, *C. Dromedarius;* both, however, are embraced under the general name of *Camel*, which in Hebrew is *Gamal;* in Arabic, *Djemal;* in German, *Kameel;* in French, *Chameau.* Their native countries are in the warmer and temperate parts of Asia, but not even here are they met with in a wild state; the whole race appears, indeed, to have been from time immemorial under the dominion of man. We trace them in the Scriptures from the earliest periods, not as wild animals, but as already subject to man's use, and especially as the great instrument of commercial intercourse. Thus, when Joseph's brethren having cast him into the pit, and after the commission of their crime sat down to eat bread, "they lifted up their eyes and looked, and behold, a company of Ishmaelites came from Gilead with their camels bearing spicery and balm and myrrh, going to carry it down to Egypt." (Genesis xxxvii. 25.) Again, in Judges viii. 21, we read that "Gideon arose and slew Zebah and Zalmunnah, and took away the ornaments that were on their camels' necks." In Genesis xxxii. 7, we find that Jacob "divided the people that was with him, and the flocks, and herds, and the camels, into two bands;" and the domestic state of the animal at this early period is further proved by verse fifteen of the same chapter, where we see, as part of the present sent by Jacob to propitiate Esau, "thirty milch camels with their colts." In Leviticus, xi. 4, the camel is enumerated among the forbidden animals, "because he cheweth the cud, but divideth not the hoof; he is unclean unto you." Part

of Job's "substance (Job i. 3) consisted of three thousand camels;" and the third messenger of evil informs him (i. 17,) that "the Chaldeans made out three bands, and fell upon the camels, and have carried them away." When, after his afflictions, the Lord blessed the latter end of Job more than his beginning (xlii. 12), "six thousand camels" formed a portion of the blessing.

The immense strength, the patient and quiet disposition, and the amount of hardship and privation which they are able to bear, have justly given to the camels a high place among domestic animals; it is even difficult to conceive how the affairs of mankind could have been carried on in the regions occupied by them without the assistance they have rendered. The inhabited parts of these countries are separated from each other by wide tracts of desert, frequently almost entirely destitute of herbage, or at all events of any that a horse would deign to eat; in many cases the sandy ground would yield under the horse's hoofs, so that he would be exhausted before half his day's journey was done, and all the while he would be exposed to the parching rays of the sun, without a chance of obtaining water more than once in three or four days. To a certain extent these eastern countries are as effectually separated from each other as if the sea rolled its waves between them; in either case some special means of passing over the interval is required. This is afforded by the camel. The desert is his home; he can feed upon the scanty vegetation that springs up here and there amid the arid wastes; his foot, by a curious provision of nature, is adapted for the sandy ground, over which he can accordingly pass without tiring for hours together, with a load of five or six hundred weight upon his back; and lastly, by another singular provision of nature, he can journey on beneath the burning sun without drinking for several days. It is no



A CARAVAN CROSSING THE DESERT.

wonder that the Arabs, in their poetical way, should have given the name of the "*Ship of the Desert*" to this valuable creature. It has recently become specially interesting to us Americans, from the fact that it has been lately used in traversing the deserts which lie between New Mexico and California, and is likely to become an important means of communication between these portions of our extended territories.

With regard to the power of the camel to support thirst, there has generally prevailed some exaggeration. It has been stated that this animal will bear deprivation of water for a period of no less than fifteen days; but Burckhardt states that the time varies greatly, according to the breed and the country in which the camels have been accustomed to travel. Thus the Egyptian and Syrian Camels require frequent draughts during the summer months, while those which journey in the Arabian deserts will go for four or five days without drinking. The same author says



THE WELL IN THE DESERT.

that some of the African caravans travel for a much longer time without water; but he considers nine or ten days to be the utmost, and even in such cases a good many camels die on the road; indeed, it is well known that the carcasses of camels given up to the vultures, form one of the common spectacles along the routes which they travel. The means by which this creature supports the long deprivation of moisture is said to be by storing up in the cells of the paunch and honeycomb stomach, a sufficient supply to last for several days' consumption. This has been disputed by some zoologists, from their finding no water in these cells on dissecting camels, and Burckhardt states that no great quantity of fluid is found in the stomachs of these animals, unless they have been drinking not long before. These reasons should not, however, be considered as conclusive, because we do not know the precise conditions under which the animals had been living. There seems, however, to be no truth in the popular belief that, when in great want of water, the Arabs kill a camel for the sake of the supply contained in its stomach, for Burckhardt never saw this plan put in practice, nor could he ever hear from the Arabs of their making use of any such method of supplying their necessities, although they frequently entertained him with accounts of the hardships they underwent in the deserts from this very cause.

For the purpose of loading and unloading, the camels are made to kneel down, and those parts of their bodies and limbs which come in contact with the ground, acquire remarkable callosities in course of time. The most considerable of these is situated on the breast. They repose in the same position, and to keep them from straying during the night, their drivers tie the fore-legs in a kneeling position, so that they cannot rise beyond their knees. When overloaded, it is said that they obstinately refuse to rise, even when they are beaten most severely, and it appears that the drivers are by no means averse to exercising their authority in this way, the poor creatures being often most inhumanly treated. The load of a camel varies considerably, according to the distance he has to go and the hardships he will have to endure. Large, powerful camels will carry a weight of fifteen hundred pounds for three or four miles, and will travel for several days with a load of a thousand pounds. Those coming to Egypt from the interior of Africa rarely carry more than five hundred weight. With such loads as these they will travel about thirty miles a day.

A great part of the internal trade of Asia and Africa has been for ages carried on by companies called *Caravans*, consisting of persons conducting numbers of these animals loaded with merchandise. The pilgrimages to Mecca are performed on the backs of camels, and sometimes several thousands are seen in a single company. In eastern countries, journeys are usually made on the

backs of these animals. The riding camels are, however, of a different breed from those employed in transporting merchandise, and a good one is as highly prized among the Arabs as a fine horse in England. Some idea of their speed and endurance may be obtained from the fact, related by Burckhardt, that an Egyptian Camel traveled a hundred and fifteen miles in eleven hours, beside being carried twice over the Nile, a process which occupied about twenty minutes each time. Many of the camels of the Bedouin Arabs and of the predatory Tartars are exceedingly swift of foot. The best easily travel a hundred miles in a day. In the interior of Africa messages are sent by them eight hundred miles in eight days. One particular species, the *Heirie*, *El Heirie*, or *Maherry* of the desert, is noted for its speed. "When thou shalt meet a heirie," say the Arabs in their poetical mode of expression, "and say to the rider '*Salem Aleik*,' ere he shall have answered thee '*Aleik Salem*' he will be afar off, and nearly out of sight, for his swiftness is like the wind."

But it is not merely as a beast of burden that the camel is useful to man. His flesh is eaten, and the hump on his back is esteemed a great delicacy. The milk of the female is also said to be good; the hair, which is long and soft, falls off in large flakes during the season of intercourse, and is woven into a sort of cloth, which is impervious to wet, and is used by the Arabs for clothing and tents. His hide is made into belts and sandals, and his dung is used for fuel. The soot of this fuel, after having undergone the process of sublimation in closed vessels, produced the sal-ammoniac, or hydrochlorate of ammonia, which was formerly imported from Egypt into Europe, where the alkali is now, however, manufactured in a variety of ways. In the East, for ages, the hair of the camel has been used for textile fabrics. The raiment of John the Baptist was of camels' hair. It is now principally imported for the manufacture of pencils for the painter. The hair which is the product of Persia, is held in the greatest estimation. There are three qualities—black, red, and gray; the black brings the best price, the red comes next in value, and the gray is only valued at half the price of the red. So many and so important, indeed, are the uses of the camel, that whole tribes inhabit the deserts subsisting almost wholly by its aid.

The camels are among the largest of the ruminants, many of them measuring as much as seven feet in height and upward of ten feet in length. Their form is by no means elegant, the dorsal humps giving them a deformed appearance, which is not lessened by their long and peculiarly curved necks and clumsy legs and feet. Their general expression of countenance and movement has something in it of weariness, disgust, and despondence; but that they are specially and admirably devised in their form, organization, and temper for the use of man, under particular circumstances of soil and climate, must be manifest to every attentive observer. The pads or sole-cushions of the spreading feet—divided into two toes without being externally separated—which buoy up, as it were, the whole bulk with their expansive elasticity, thus preventing them from sinking in the sand, on which they advance with silent step; the nostrils, so formed that the animal can close them at will to exclude the drift sand of the parching simoom; the powerful upper incisor teeth for assisting in the division of the tough, prickly shrubs and dry, stunted herbage of the desert; and, above all, the cellular structure of the stomach, which is capable of being converted into an assemblage of water-tanks—bear ample testimony to the care and wisdom exercised in the structure of this extraordinary quadruped. Both species have the same general characteristics. Their sense of smell is acute, and in traversing the desert it is often strikingly displayed. When apparently almost worn out, and when all have been on the point of perishing with thirst, one has been known to break his halter and run with unerring certainty to a spring which had escaped the observation of the other quadrupeds of the caravan, and of man himself.

The Bactrian Camel, usually called by way of eminence The Camel, is distinguished by having two humps on the back. Its length is about ten feet, though many are smaller and some larger; the hair is shaggy, especially under the throat; the color is generally dark-brown, though there are varieties in this respect, some being gray and some white. It is larger and stouter, and is relatively lower on the limbs, than the Dromedary. It originated in that part of Tartary occupied at present by the Usbecks, and anciently known as Bactriana. It is essentially the camel of cold or temperate climates, as the dromedary is the camel of hot climates. It has been employed from the most ancient times in domestic and military service; for thousands of years it has

been the great instrument by which the vast interior trade of the rich and fertile countries of the middle zone of Asia has been conducted. Some of the breeds are acclimated in the cold or temperate regions west of the Taurus and Himalayas, and even in the countries of the Caspian and amid the steppes of the Crimea, supporting the rigors of these harsh climates as well as any other animals.



THE DROMEDARY, OR ARABIAN CAMEL.

The Dromedary, or, as it is often called, the Arabian Camel, is distinguished by a single hump, a lighter form, and a more rapid movement than the other species. There are three varieties, the *Brown* or *Caucasian Dromedary*, which is stouter and more robust than the others; the *Egyptian Dromedary*, which is of large size, and covered with short gray hair, and the *White Dromedary*, which is in part whitish-gray, the head, neck, hump, and fore-limbs being covered with long hair. It is true that the Bactrian and Arabian Camel are both bred and used in some localities, but the varieties of the latter are almost exclusively employed in Africa, Turkey, Asia Minor, and Arabia; many also are used by the marauding Tartars. They are particularly suited to arid and sandy countries, and are wholly used in crossing the wastes of Sahara, more appalling than the waves of the sea, where, indeed, whole caravans have been buried in the drifting billows of sand, and where in some places the surface of the earth is whitened with the bones of men and camels which have perished from thirst. This species is the one employed by the Hebrews in the patriarchal ages, and it appears that this nation introduced it into Egypt. In the conflict with Mithridates, the Romans under Lucullus first met soldiers mounted on camels. The Carthaginians did not use these animals, and they appear to have arrived in Northern Africa after the conquests of Belisarius in that quarter. At the present day multitudes of these animals are seen not only in the caravans crossing the deserts, but in the cities of Morocco, Algiers, Tunis, Cairo, Alexandria, and indeed throughout Africa, Arabia, and Syria.



CAMELS AT DAMASCUS.

A few years since the Government of the United States took measures for the introduction of the Camel into the southern part of this country. In the autumn of 1857 a number of them, which had been brought in government vessels from the borders of the Mediterranean, were placed under the charge of Lieutenant Beale, commander of an expedition to explore a route for a wagon road from New Mexico to California. In a report made by this officer to the Secretary of War, after he had reached the shores of the Pacific, dated October 18, 1857, he says: "An important part in all of our operations has been acted by the camels. Without the aid of this noble and useful brute, many hardships which we have been spared would have fallen to our lot; and our admiration for them has increased day by day, as some new hardship, endured patiently, more fully developed their entire adaptation and usefulness in the exploration of the wilderness. At times I have thought it impossible they could stand the test to which they have been put; but they seem to have risen equal to every trial, and to have come off from every exploration with as much strength as before starting. Unsupported by the testimony of every man of my party, I should be unwilling to state all that I have seen them do. Starting with a full determination that the experiment should be no half-way one, I have subjected them to trials which no other animal could possibly have endured, and yet I have arrived here, not only without the loss of a camel, but they are admitted by those who saw them in Texas to be in as good condition to-day as when we left San Antonio.

"In all our lateral explorations they have carried water, sometimes for more than a week, for the mules used by the men, themselves never receiving even a bucketful to one of them; they have traversed patiently with heavy packs, on these explorations, countries covered with the sharpest volcanic rock, and yet their feet to this hour have evinced no symptom of tenderness or injury; with heavy packs they have crossed mountains, ascended and descended precipitous places where an unladen mule found it difficult to pass, even with the assistance of the rider, dismounted, and carefully picking its way. I think it would be within bounds to say that in these various lateral explorations they have traversed nearly double the distance passed over by our mules and wagons.

"Leaving home with all the prejudice attaching to untried experiments, and with many in our camp opposed to their use, and looking forward confidently to their failure, I believe, at this time,

I may speak for every man in our party, when I say there is not one of them who would not prefer the most indifferent of our camels to four of our best mules, and I look forward hopefully to the time when they will be in general use in all parts of our country."

This report contains an interesting account of the admirable manner in which these animals swam the Colorado River, thus removing all doubt as to their capacity for this species of service. Lieutenant Beale arrived at San Francisco, and the editor of a leading journal of that city says: "The experiment of the camels and dromedaries has proved a triumphant success. In opposition to the opinions of many United States officers, they have shown themselves admirably adapted for traversing the wastes of Western America. In some instances these wonderful animals went a week, and in one ten days, without water—not because it did not exist on the route, but from a lack of desire for it; and on the tenth day the animal drank with comparative indifference. They could go, if required, over two weeks without tasting water. Their food is of the simplest and coarsest description; they eat, as they progress, whatever grows on the way-side, bending their long necks and thrusting their heads alike into the narrowest crevices, for the cactus or the stunted verdure, or cropping the leaves from the boughs of the trees, without in the least retarding their speed. Truly they may be called the ships of the desert, and, when taken in comparison with mules, horses, or cattle, which require food almost as regularly as man, they seem adapted by nature to the novel task to which our government has now applied them."*



THE DEAD CAMEL AND THE VULTURES.

* In the autumn of 1855 the United States storeship *Supply*, under command of Lieutenant Porter, was sent to the Mediterranean to obtain camels to be taken to Texas and tried, so as to ascertain whether they were suited to that climate, and to that of New Mexico and California. Thirty-three were procured, mostly in Egypt and Smyrna; two being of the Bactrian and thirty-one of the Arabian species; one was a cross called *Booghdee* or *Tuilu*. With these the vessel sailed, and after a rough passage arrived and landed them all safely at Indianola, Texas, May 14, 1856. Five young ones were born on the passage; all, however, died but one. The correspondence with the War Department of Major Wayne, who accompanied Lieutenant Porter, and was chiefly charged with the purchase of the camels, has been published, and is exceedingly interesting, not only on account of the details of his operations, but the curious and minute information he gives respecting the camel in the countries where it has been in use for ages. A letter of Lieutenant Porter's to the War Department, giving an account of the expedition, has also been published, and is alike valuable and interesting.

The storeship *Supply* made another successful trip to the Mediterranean for camels in 1856-7, but we have not the official details. In 1858, one hundred camels were imported into New Orleans on private speculation.



THE LAMA.

Genus LLAMA, or LAMA: *Auchenia.*—These animals, which appear like small camels, and represent these animals in the New World, are, however, readily distinguished from them, not only by the difference of size, but by the absence of dorsal humps and the complete division of the toes. This structure of the feet does not adapt them for traveling over such sandy wastes as form the natural home of the camel, but for dwelling on mountains and among rocks, where, in point of fact, their footing is more sure than that of most other animals. Their form is lighter and more elegant than that of the camel; they are not only smaller, but far inferior to their eastern relatives in strength. Their native region is upon the slopes of the immense chain of the Andes, in South America, on all parts of which they occur; and although inhabitants of tropical climates, they are very impatient of heat, and often ascend into the vicinity of the line of perpetual snow. The wild lamas are very vigilant and shy; they live in flocks at a great altitude upon the mountains, and only descend toward the plains occasionally in search of food. Both the wild and the tame lamas have the singular habit of always, when practicable, dropping their dung in the same place, so that considerable heaps of excrement are found in particular spots; the wild ones have also been observed to retire in the same way to a particular spot to die, and in some places it is said portions of the banks of rivers may be seen almost whitened with their bones. When irritated, they eject the contents of their mouths, consisting of food undergoing its second mastication, upon the offending party; this is doubtless exceedingly disagreeable, but the popular belief in the venomous nature of the substance discharged is destitute of foundation.

Considerable doubts exist as to the number of distinct species of lamas. It has been supposed that there are four species, but some zoologists reduce them to two, considering the others as domesticated varieties. Other writers, on the contrary, increase the number to five or even six. There appear, however, to be three species, the true *Lama*, the *Paco*, and the *Vicuna*. The term *Lama*—equivalent to *cattle*—is applied by the natives to all these kinds. The name of *Peruvian Sheep* was given to them by the early European settlers.

The Guanaco, or Huanaco, *A. Guanaco*, is regarded as the wild stock from which the true lama is derived. They stand rather more than three feet high at the shoulder, and the neck,



THE PACO.

which is often carried upright, bears the head at a height of nearly five feet from the ground. They are of a pale reddish-brown color, and covered with long hair, which, however, is not so long as that of the domesticated lama. When taken young, they may be tamed, but always retain a tendency to return to the wild state. They inhabit the Cordilleras of the Andes, but principally in Peru and Chili. They are rare in Colombia and Paraguay, and seldom make their appearance on the eastern side of the chain. They associate together in herds of one or two hundred individuals, and subsist on a peculiar kind of grass or reed called *ycho*. While they can procure green herbage they are never known to drink, and it may therefore be presumed that they have the power of secreting from their food sufficient liquid to satiate their thirst. They do not appear to be so insensible to cold as the Vicunas, which are generally found at a much greater elevation, and have a much thicker, finer, and closer fleece. At the beginning of the winter they abandon the mountains on which they have passed the summer and descend into the valleys. Here the Chilians hunt them with dogs, which, however can catch only the younger and less active individuals. The old ones are so swift as scarcely to be run down by an excellent horse, thus offering a striking contrast to the extreme slowness of their motions when in captivity and loaded with heavy baggage. When chased they frequently turn upon their pursuers, neigh with all their might, and then set off again at full speed. One mode of capturing them by the Indians is for many hunters to join and drive them into a narrow pass, across which cords have been drawn about four feet from the ground, with bits of cloth or wool tied to them at small distances. This apparatus with its pendant trumpery frightens the animals, and they crowd together, so that the hunters kill them with stones tied to the end of leathern thongs.

The Lama, sometimes called the *American Camel*, *A. glama*, is the domesticated Guanaco, and takes the place of the camel among the Indians of Peru and Chili. It is of about the same size as the Guanaco, the principal differences between them being such as might well be produced by domestication, namely, a stouter and heavier form and a variety of colors, black, brown, and gray being the most common; some are mottled, some piebald, and a few white—a white Lama being the presiding deity of the natives of Callao. The lama is employed as a beast of burden, and although it is unable to bear a great weight—ninety to a hundred and twenty pounds being about the heaviest load that it can carry—its power of traveling over rugged declivities, where no other loaded animals could maintain their footing, has rendered its services indispensable in those countries even to the present day, although its place has been to a certain extent taken by mules. It is, however, slow in its march, rarely traveling more than ten or twelve miles a day. When killed, its flesh furnishes a wholesome and excellent food—and which is common in the markets of Peru; the long, woolly hair with which it is covered forms the principal clothing of the Indians.



THE VICUNA.

The keeping of a herd of lamas is a matter of little or no difficulty; at night they are put into an inclosure, where they sleep winter and summer without any protection, although at the elevation at which they usually live the temperature often falls below the freezing-point immediately after sunset, even in the summer. In the morning they are allowed to quit the inclosure to wander about upon the mountains in search of food, and they return of their own accord in the evening. The dung, like that of the camel, is employed as fuel; the milk is said to be pretty good, but the natives did not use it prior to the arrival of the Spaniards; the skin furnishes a good leather.

These animals seem to have been to the aborigines what the reindeer—with the exception of the milk—is to the Laplander. Surrounded by herds of such animals, which required almost no care, and by the spontaneous productions of the soil, the Indian had little incentive to improvement. Humboldt has an eloquent passage on this subject: "When we attentively examine this wild part of America, we seem to be carried back to the first ages, when the earth was peopled step by step; we appear to assist at the birth of human societies. In the Old World, we behold the pastoral life prepare a people of huntsmen for the agricultural life. In the New World, we look in vain for these progressive developments of civilization, these moments of repose, these resting-places in the life of a people. . . . . Those species of ruminating animals which constitute the riches of the people of the Old World are wanting in the New The bison and the musk-ox have not yet been reduced to the domestic state; the enormous multiplication of the Lama and the Guanaco have not produced in the natives the habits of the pastoral life." Gregory de Bolivar calculates that four millions of lamas were killed annually in his time, to be eaten, and that three hundred thousand were employed in the transport of the produce of the mines of Potosi alone. The number in domestic use in all South America must have been enormous. But these multitudes are lessened, and the race itself will probably ere long be extinct. Civilization has brought with it the animals of the old continent. The horse and the mule have almost entirely superseded the lamas as beasts of burden in the open country, and the sheep and the goat have taken their place, in a great measure, as contributors to the food and raiment of man.

The Paco, or Lama Paco, or Alpaca, *A. Paco*, which is also domesticated by the Peruvians, is considerably smaller than the lama, and is never employed as a beast of burden; it is principally valued for the sake of its soft, silky hair, sometimes a foot in length, which is woven into fabrics of great beauty. Large quantities have lately been imported into Europe for this purpose.

The Vicuna, or Vicugna, or Lama Vicuna, *A. vicunna*, is about the same size as the Alpaca; its color is reddish-yellow on the back and whitish on the belly. It is a wild species, which is principally sought after for the sake of its fine wool, from which esteemed stuffs are largely woven.



THE COSSACK HORSE. THE CART-HORSE. THE ARABIAN.

ORDER 10. **SOLIDUNGULA.**

This order contains but a single family, the *Equidæ*, of which the horse is the type.

THE EQUIDÆ.

This family embraces the *Horse*, *Ass*, *Dzeggetai* or *Hemione*, the *Zebra*, *Quagga*, and *Onager* or *Dauw*. These are all originally natives of the Eastern Continent; all are naturally herbivorous, and live together in large herds, defending themselves when attacked by kicking with their heels. Two of the species, the Horse and Ass, have been domesticated by man; the rest continue in a wild state. In their structure they are characterized by six incisors to each jaw, which, during youth, have their crowns furrowed with a groove, and six molars on each side above and below, with square crowns, marked by laminæ of enamel which penetrate them, with four crescents, beside which there is a small disk on the inner border of those above. The males have in addition two small canines in their upper jaw, and sometimes in both, which are always wanting in the females. Between these canines and the first molar there is a wide space which corresponds with the angle of the lips where the bit is placed, by which alone man has been enabled



JULIUS CÆSAR.

to subdue these powerful quadrupeds. Their stomach is simple and middle-sized; but the intestines are very long, and the cœcum enormous. The mammæ are situated between the thighs. They are distinguished from all other animals in having a solid or undivided hoof, the two anterior toes being, as it were, soldered together. While possessing these characteristics in common, they are divided into two distinct genera, that of the Horse, *Equus*, containing a single species, and that of the Ass, *Asinus*, containing the other members of the family.

Genus HORSE: *Equus.*—This comprises the Horse, *E. caballus*, an animal which in all ages has captivated the imagination of man. In ancient times, when war was the great game of life, the horse was chiefly noted as the associate of the warrior. History has so instructed us that the images of the great warriors of antiquity—Alexander and Cæsar, Alaric and Attila, Saladin and Cœur de Lion—habitually present themselves to the imagination as mounted upon the horse. The equestrian statue is the popular apotheosis of the warrior, and not of antiquity only but of modern times, for even Wellington and Washington are thus consecrated in imperishable bronze. It may be wrong, but nevertheless it is true, as matter of fact, that the warrior in all ages is regarded as the highest type of his race, and the same is true of his brute companion, the war-horse being always regarded as the noblest of his species. The songs of the troubadour and the minnesinger have been hardly more inspired by the deeds of the heroes of chivalry than by those of their steeds. Nay, even the inspired penman has given us a portrait of the war-horse which manifests a similar enthusiasm. "His neck," says the author of the Book of Job, "is clothed with thunder; the glory of his nostrils is terrible. He paweth in the valley, and rejoiceth in his strength; he goeth out to meet the armed men. He mocketh at fear, and is not affrighted; neither turneth he back from the sword. The quiver rattleth against him, the glittering spear, and the shield. He swalloweth the ground with fierceness and rage; neither believeth he that it is the sound of



ATTILA.

the trumpet. He saith among the trumpets, Ha, ha! and he smelleth the battle afar off, the thunder of the captains, and the shouting."

In more modern times Buffon has given us a sketch hardly less poetic: "The noblest conquest which was ever made by man is that of this spirited and haughty animal, which shares with him the fatigues of war and the glory of the combat. Equally intrepid with his master, the Horse sees the danger and braves it; inspired at the clash of arms, he loves it, he seeks it, and is animated by the same ardor. He feels pleasure also in the chase, in tournaments, in the course; he is all fire, but, as tractable as courageous, he does not give way to his impetuosity, and knows how to check his inclinations; he not only submits to the arm which guides him, but even seems to consult the desires of his rider, and, always obedient to the impressions which he receives from him, presses on, moves gently, or stops, and only acts as his rider pleases. The Horse is a creature which renounces his being to exist only by the will of another, which he knows how to anticipate, and even express, and execute by the promptitude and exactness of his movements; he feels as much as we desire, does only what we wish, giving himself up without reserve, and refuses nothing, makes use of all his strength, exerts himself beyond it, and even dies the better to obey us."

Nor is this mere poetry: *"Although the invention of gunpowder has invested the modern battle-field with all the attributes of that thunder which the ancients regarded as being possessed only by the chief of their gods, it has no effect upon the war-horse, after proper training, but to excite his courage and make him more brave and bold amid the augmented terrors. Roaring artillery, sheeted flame, curling smoke, gleaming steel, rolling drums, sounding trumpets, and all the sights and the din of the hottest conflict, never affect either the courage or the coolness of the veteran charger. He will bear his rider up to the cannon's, or to, or even on, the point of the lance, with the same cheerful obedience as if he were riding to a field of the richest pasture, and though beaten back, and smarting with wounds, he will return again and again to the charge; nor will he quit his duty until he has made the final sacrifice, and his bones are gathered to the unseemly heap in which horses and their riders lie promiscuously together.

"But it is only while there is a rider on his back that the horse continues thus obedient to his duty; for when the ranks are broken, and the riders gone, horses may be seen careering over the field, as if absolutely in quest of new riders to bring them again into action; and it is said that,

* See "British Cyclopedia of Natural History," article Horse.



SALADIN.

upon these occasions, the horses rarely, if ever, trample upon the bodies of the wounded or the dead with which the field is scattered. If a trumpet sound, too, the riderless horse, if not frantic with the agony of wounds, will follow upon the sound, but will turn away again if he finds that the uniform of the party is not like that of his own regiment. If his rider falls when the horse is at considerable speed, the horse instantly stops, so that an exchange is frequently soon made of a rider who has lost his horse and a horse that has lost his rider. Veteran horses are rarely, if ever, panic-struck, and though they are, of course, liable to be taken prisoners, they never desert to the enemy.

"The most remarkable fact of the whole matter, however, is the evident fondness which horses that have been accustomed to it have for the army; and this appears both in their fondness for particular regiments and in that for all military array, and even military weapons. It is told that, in one of their insurrections in the early part of this century, the Tyrolese captured fifteen horses belonging to the troops sent against them, and mounted them with fifteen of their own men, in order to go out to a fresh rencounter with the same troops; but no sooner did these horses hear the well-known sound of their own trumpet, and recognize the uniform of their own squadron, than they dashed onward at full speed, and in spite of all the efforts of their riders, bore them into the ranks, and delivered them up as prisoners to the squadron! If an old military horse, even when reduced almost to skin and bone, hears the roll of a drum or the twang of a trumpet, the freshness of his youth appears to come upon him, and if he at the same time gets a sight of men clad in uniform and drawn up in line, it is no easy matter to prevent him from joining them.

"Nor does it signify what kind of military they are, as is shown by the following case. Toward the close of the last century, about the time when volunteers were first embodied in the different towns of England, an extensive line of turnpike road was in progress of construction in a part of the north. The Clerk to the Trustees upon this line used to send one of his assistants to ride along occasionally in order to see that the contractors, who were at work in a great many places,



THE HORSE IN THE PAGEANTRY OF WAR.

were doing their work properly. The assistant, on these journeys, rode a horse which had for a long time carried a field-officer, and, though aged, still possessed a great deal of spirit. One day, as he was passing near a town of considerable size which lay on the line of road, the volunteers were at drill on the common, and the instant that Solus—that was the name of the horse—heard the drum he leaped the fence, and was speedily at that post in front of the volunteers which would have been occupied by the commanding officer of a regiment on parade, or at drill; nor could the rider by any means get him off the ground until the volunteers retired to the town. As long as they kept the field the horse took the proper place of a commanding officer during all their maneuvers, and he marched at the head of the corps into the town, prancing in military style, as cleverly as his stiffened legs would allow, to the great amusement of the volunteers and spectators, and the no small annoyance of the clerk, who did not feel very highly honored by Solus making a colonel of him against his will."

In addition to this high spirit in the horse, which echoes so well the fiery impulses in the bosom of man, and which has placed him in the very foreground of the more active and progressive portions of human history, whether amid the appalling horrors of the battle-field, or the more enticing scenes of martial pomp and pageantry, there are other circumstances which render this animal an object of peculiar interest. It has been said that "so far as we can predicate morality of a creature unendowed with an immortal spirit, the horse has a moral history. Many animals live in a state of perhaps more close domestication than the horse does, and the dog especially, being one which in a state of nature requires more art and stratagem for finding his food, is capable of evincing his attachment to his master in a greater variety of ways. The dog will fight for his

master, will fawn upon his master, and will watch and defend his master's property, with a fidelity perhaps unequaled by the human race. The horse does not fight of himself, for his nature is the very opposite of pugnacious; the horse does not fawn, for the spirit of the horse is noble; but the horse, if the expression may be used, stands to his rider more in the relation of a companion and equal than any other animal stands to man. There is, also, in the gratified look, the erected ears, the arching neck, and the subdued and murmuring neigh of the horse at the sight of that rider with whom he has been long associated, something more touching, or if you will, more poetical, than in the fawning of all the dogs in the world.

"Then there is no danger which the horse will not brave along with his rider, and on those occasions man very often borrows courage from the spirit of the animal. In the darkness of night, when the traveler knows not his way, and would be incapable of reaching his home, his faithful horse will carry him in safety through the most difficult places, and be the path ever so intricate, and the obstacles ever so many, if the rein is entirely given up to the horse, not a foot of his will slip or be misplaced on the most difficult ground, and not one of the obstacles will he come in contact with. This is a curious point in physiology, but it is as true as it is worthy of admiration. The firm and entire hoof of the horse, even when shod with iron, seems to acquire in the dark a sense of touch equal to the most delicate finger, and though we cannot account for it, every hair upon the skin of the animal appears to be instinct with all the senses necessary for guiding him along with the same certainty as though it were clear daylight all about him. If the horse and the rider have been long acquainted with each other, and have frequently made nocturnal journeys, it is of no consequence, if the journey is a homeward one, whether the rider pays the slightest attention to the matter or not, for there have been many instances in which an old and trusty horse has carried his rider asleep for a distance of more than twenty miles. There have been also instances of favorite ponies carrying blind musicians from house to house for the purpose of giving lessons; and indeed it would be impossible to enumerate half the instances which are well authenticated of quiet and slow-going horses finding and keeping the way without any assistance from their riders, and the same applies to horses habitually used in draught."

From these and other similar considerations, it is easy to comprehend the place which the horse has occupied in history as well as poetry. In reading the history of Alexander, we not only appreciate but applaud the honors bestowed by him on Bucephalus, without whose aid, or the aid of some similar beast, he had never figured as the conqueror of the world.* In thus noticing the

* In the history of "The Spanish Conquest of Mexico, &c.," by Arthur Helps, recently published, we have the following passage:

"The battle, if battle it may be called, in which perhaps hardly any weapons were crossed except by accident, lasted little more than half an hour, for the sun had already set when the action had commenced. It was rightly said that the shades of night would prove the best defense for the Indians. The Spaniards remarked that the horses which the evening before had scarcely been able to move on account of the cold which they had suffered in their journey over the mountains, galloped about on this day as if they had nothing the matter with them.

"All that the fiercest beasts of the forest have done is absolutely inappreciable when compared with the evils of which that good-natured animal, the horse, has been the efficient instrument since he was first tamed to the use of man. Atahuallpa afterward mentioned that he had been told how the horses were unsaddled at night, which was another reason for his entertaining less fear of the Spaniards, and listening more to the mistaken notions of Mayzabilica, who had counseled an engagement.

"Saddled or not saddled, however, in the wars between the Spaniards and the Indians the horse did not play a subordinate part; the horse made the essential difference between the armies, and if in the great square of Madrid there had been raised some huge emblem in stone to commemorate the conquest of the New World, an equine, not an equestrian figure would appropriately have crowned the work. The arms and the armor might have remained the same on both sides. The ineffectual clubs and darts and lances might still have been arrayed against the sharp Biscayan sword and deadly arquebus; the cotton doublet of Caseo against the steel corslet of Milan; but without the horse, the victory would ultimately have been on the side of overpowering numbers. The Spaniards might have hewn into the Peruvian squadrons, making clear lanes of prostrate bodies. Those squadrons would have closed together again, and by mere weight would have compressed to death the little band of heroic Spaniards. In truth, had the horse been created in America, the conquest of the New World would not improbably have been reserved for that peculiar epoch of development in the European mind when, as at present, mechanical power has in some degree superseded the horse, that power being naturally measured by the units of the animal force which it represents and displaces."

With the general idea contained in this passage, that the horse has been a great instrument of mischief to mankind, we can by no means agree. That his power, as well in war as other things, has been abused, is a matter of course; that it was even abused in this war upon Mexico we may admit; yet we cannot but feel that, all things con-



THE RACE-COURSE.

part which the horse plays in war, and in farther reflecting upon his temper, which makes him the intimate associate of man, and on his instincts, which in many cases surpass reason, we readily catch the thread of association by which the imaginative Greeks were led to mount the poet who would scale the giddy heights of Parnassus upon the winged Pegasus, and, amid the superstitions of the Middle Ages, created for the heroes of chivalry horses endowed with wings and the gifts of enchantment. The same impulse that led poets to deify heroes, caused them to confer similar and often greater powers on their companion, the most heroic of animals. The cart-horse may be more useful than the war-horse, as the plowman may be more useful than the warrior, but what minstrel has ever chanted the praises of these humble drudges? The love of chivalrous deeds is inherent in human nature, and he who tells their story will always have listeners. Cervantes, with a fine perception of the feelings of mankind, though his purpose was to ridicule the extravagance of chivalry, never made either Don Quixote or Rosinante contemptible. In the midst of all their misadventures there is a certain dignity which commands our respect, even while our sides are bursting with laughter. With Sancho and his ass it is otherwise: these are presented in the full breadth of their native meanness and vulgarity. And this portraiture, as it reflects the human heart, has for centuries received the sanction of mankind. The warrior has always captivated the popular imagination, and the war-horse is the beau ideal of his race, as well in the sacred page as the common sense of mankind.

It is not to be supposed, however, that it is in war alone that the horse commends himself to mankind. On the "Turf" he creates a new world, with its own peculiar atmosphere, its own dialect, its own codes, its own literature. Nowhere can we find a more exciting spectacle than the race-course, especially in England, where princes and nobles produce their favorite steeds to contend for the prizes, and themselves enter into all the mad enthusiasm of the scene, often risking thousands of pounds on the chance of a single race. Under the saddle the horse imparts to his rider an exultant emotion like that we feel in dreaming, when we seem to be flying. The young

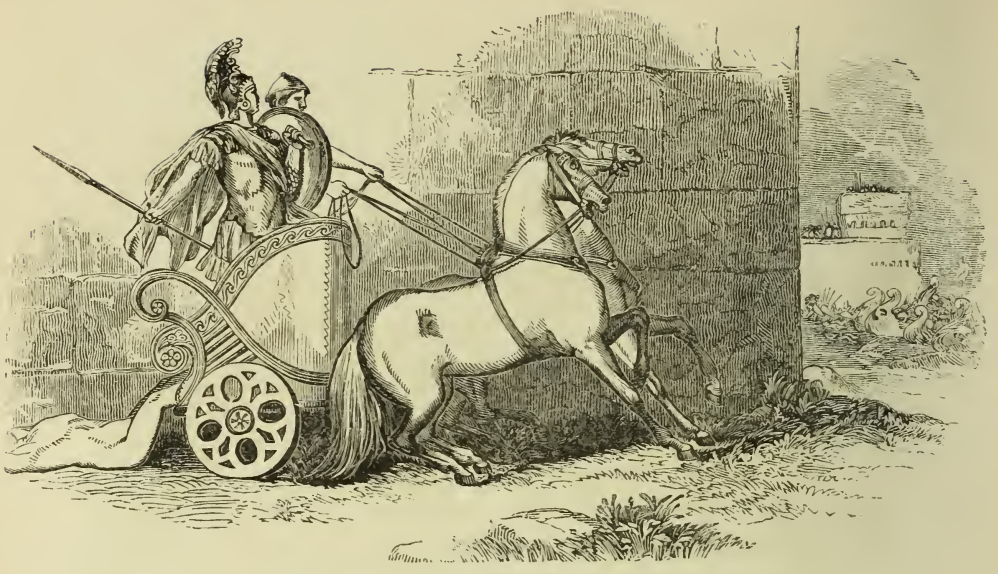
sidered, this animal has been one of the chief instruments of human progress and human civilization. So much is almost confessed in the statement that in the conflict between Cortez and the Mexicans the horse made the essential difference; for it gave civilization the ascendency over barbarism. The fact is striking and well put, but it is to the credit of this noble animal, and affords an additional testimonial to the great work it has done in its association with man. A recent writer has given us the "*History of Man upon the Sea*;" a "*History of Man upon the Horse*" would be a theme hardly less exciting; at least we think it would be more so than the "*History of Man without the Horse*," which would be little more than the history of barbarism.



THE HORSE IN CHIVALRY.

man on horseback seems to feel that the strength and speed of the horse are a part of his nature, and even the old man, when his limbs begin to falter, receives something of the animation of youth when mounted upon his favorite horse. The fair dame, more fair than ever, and conscious of her advantage, breathes the air of Elysium when she skims the earth upon her palfry. The robber, the assassin, having secured his booty or struck his blow, enjoys, with his foot in the stirrup, a sense of security and triumph as he flies from the scene of his guilt, even though it be in the blackness of night. The hunter, whether with hound and horn in chase of the fox, or with bow and arrow or rifle straining across the prairies of the far west in pursuit of the bison; or on the illimitable pampas with his whirling lasso, as he thunders in the track of herds of wild cattle; or in the wildernesses of Africa, more fearless than Nimrod, chases countless troops of antilopes, deer, quaggas, buffaloes, rhinoceri, hippopotami, elephants, and giraffes—the hunter in all these scenes is elevated by the horse he rides from the slow, plodding, feeble biped, to the realization of a double existence—the might, majesty, and domain of the fabled centaur. To the lordly dame that rolls pompously along in her coach; to the humble drudge that follows the plow; to the weary wagoner along the dirty road; to each and all the horse contributes the luxuries or the necessities of life. In some countries—as among the Tartars—the flesh of the horse is highly relished.* We have hardly come to that, though in some parts of Europe, and especially at Vienna, we are told that horse-steak is esteemed delicious. It is true that in most cases we make an end of our domestic animals by eating them; but as to the horse, when he can do no more

* The question whether horse-flesh is edible has been much discussed by the savans of Europe, especially of late, and the general opinion is that it is alike nutritious and savory. Gervais says, "We may rank the horse among the alimentary animals. The flesh of a young horse is excellent, and that of the wild horse is still better. In some countries this is habitually eaten, and in others the flesh of the domestic horse is common in the butcheries. In time of war a good use may be made of the flesh of wounded horses, or those that are killed on the field. In time of famine the horse has been eaten even at Paris. In 1793 a part of the inhabitants of this city were fed on horse-flesh without perceiving it. Some naturalists have asked why this aliment has not become common, and have come to the conclusion that on this subject society has much to learn." "In Denmark and other countries, where horse-flesh is eaten, the prejudice against it constantly diminishes."—*Histoire Naturelle des Mammiferes.*



GREEK HORSES, FROM THE FRIEZES OF THE PARTHENON.

for us, and his time is come, we content ourselves by stripping off his hide, making manure of his blood, Prussian blue as well as cat and dog meat of his flesh, and a top-dressing for our fields of his pulverized bones. Truly the horse enters largely into the pleasures as well as the pains of human life!

The history of the horse, as far as we are able to trace it, always presents that animal as subdued to man's use; nowhere does it give us any account of wild horses, except such as have been bred from domestic ones. The earliest written notices of this animal are in the sacred writings. Abraham, Isaac, and Jacob had asses, which are spoken of in the enumeration of their riches, with camels and sheep, but nowhere is it stated that they had horses. In the time of Moses, the Hebrews did not use them even in battle, though Pharaoh and his host came against them with chariots drawn by horses.

King David, we are told, captured a thousand chariots and seven hundred horsemen in his conflict with Hadadezar, the Philistine, but he houghed or hamstrung all the horses save one hundred, which he reserved for chariots. But Solomon his successor, it appears, introduced this animal largely into the military and state service, for the Bible tells us he had forty thousand stalls of horses for his chariots and twelve thousand for his cavalry. These animals came partly from Egypt and partly from Coa.

The Book of Job informs us that the Arabians were in possession of this animal, but Strabo says that in his time they were not found in the southern portions, comprehending the greater part of Arabia Felix. When Mahomet, in the early part of his career, marched against Mecca to chastise his enemies there, he had only two horses in his army, and it is to be noted that amid his spoils there were camels and sheep, and silver and captives, but no horses. The subsequent conquests of the followers of the prophet supplied them with horses, and from that time the breeding of them has been carefully practiced in Arabia. The famous Arabian breed is of comparatively modern date.

Homer, in the Iliad, speaks of the numerous stud of Priam, and says that Erichtonius, an ancestor of the Trojan king, had three thousand mares and the like number of colts. The Greeks, however, did not use the horse in war till long after it had been thus employed in Egypt, Assyria, and Scythia. At the battle of Marathon, 490 B. C., they had no horses, and at that of Platæa, a year later, with an army of one hundred and ten thousand foot, they had not a single squadron of cavalry. They were in fact in danger of being trodden underfoot by the myriads of Persian



ASSYRIAN HORSES, COPIED FROM THE RUINS OF NINEVEH DISCOVERED BY LAYARD.

horsemen. Prior to this, however, the horse was undoubtedly used in Greece for other purposes; we know that it had been long used in the chariot races of the Olympian games, and the beautiful remains of the Parthenon, built in the time of Pericles, show that the Greek horses at that time were of the finest breeds, and that the art of horsemanship was well understood. Horse-breeding for the chariot and for riding was in fact a mania among the Greek youths of this period, and may have borne some resemblance to what is witnessed among the lovers of the "turf" at the present day in England. When, however, Macedonia gained an ascendency in Greece, the war-horse was introduced. Alexander charged at the head of his cavalry, and in the subsequent ages of Greek history we find mounted soldiers constituting an essential portion of the Greek armies. The Macedonians obtained their horses from the north, and undoubtedly they were of the Tartar stock; the Greeks obtained theirs from Asia Minor, which was early a leading mart for the finest breeds of horses.

The recently excavated sculptures of Nineveh show us that the Assyrians, at an early age, had magnificent horses, as well for war as the chase.

The vestiges of Egyptian antiquity prove that at a date equally remote the valley of the Nile was supplied with similar breeds.*

The Scythians, the ancient progenitors of the Tartars, are said first to have exercised the art of riding on horseback. When their mounted hordes invaded Thrace—long prior to the time of the Trojan war—the Greeks regarded the man and horse as one animal, as did the Mexicans in the time of Cortez, and hence, it is said, arose the fable of the centaurs. Scythia in ancient times

* According to the Bible account, Abraham, about 1900 B. C., received presents of sheep, oxen, camels, &c., *but no horses*, whence it is reasonably inferred that at that time horses were not in common use in Egypt. But in the time of Joseph, about 1700 B. C., we are told Jacob's funeral was attended by "chariots and horsemen." It is held by good authorities that this was the period of the *Hyksos* or *Shepherd Kings*, whose conquest and occupation of Egypt for two hundred and fifty years hold so prominent a place in the ancient history of that country, and Champollion is of the opinion that these Hyksos were Scythians. Admitting these two opinions, we have a striking solution of the fact that about this period (that is, somewhere between the time of Abraham, 1900 B. C., and Joseph, 1700 B. C.,) horses were introduced into Egypt, inasmuch as these Hyksos, or Scythians, as we know from other sources, used horses and made invasions of distant countries with mounted armies at a very remote date. Two plain inferences flow from this view of the case, if it be admitted: *first*, that Scythia, or as we now call it, Tartary, was the original habitat of the horse, and *second*, that the Scythians were the first nation which history presents as having used the horse. We know that it has been asserted that the Egyptians were the first to use the horse, and from this fact, as well as because the quagga and zebra, both of the equine genus, are found native in the contiguous deserts of Africa, it has been held that Africa was the birth-place of the horse. From what we have said above, it is clear that the claim of Egypt to the first use of the horse, and of Africa as its original seat, are both unfounded, or at least problematical.



ANCIENT EGYPTIAN WAR-HORSES, FROM THE MONUMENTS.

was a great nursery of horses, as is Tartary in modern times, and these animals have in all ages constituted a large part of the military strength of these regions.

The ancient Parthia was a portion of the present Independent Tartary, and to its horses we must attribute its chief celebrity in war. The contiguous countries of Media and Armenia from the earliest ages possessed fine breeds of horses, and they were cultivated in large numbers. In



ANCIENT PARTHIANS.

all these portions of Asia the horse—adapted alike to the climate and the spirit of the people—has been a favorite animal from time immemorial. The ancient Scythian on horseback was in fact almost the realization of the centaur; his descendant, the modern Tartar, almost lives on



ANCIENT SCYTHIANS.

horseback; from childhood he is familiarized to the art of riding, guiding, and governing this animal. Nowhere is the power of the horse so wedded to the life of man. Man here—not the individual, but the genus, the tribe—seems actually born with a horse under him, and thus in a measure to circumvent time and annihilate distance. The power of clinging to the horse, even while in full career, at the same time throwing the body in various positions, on the neck, on the croup, on this side and that; nay, almost beneath the belly, and at the same time whirling the spear, launching the javelin, or discharging the arrow, is possessed by the Arab, the Turk, and in a remarkable degree by the Camanches—but in these exercises, as well as in the practice of legitimate horsemanship, the Tartar is the master of them all.



ANCIENT MEDIAN SOLDIERS.

Persia has also had fine breeds of horses from an early date. Cyrus, we are told, had collected in his stud eight hundred stallions and sixteen hundred mares. From that time to the present



ANCIENT PERSIAN WAR-HORSES.

the breeding of these animals has been an object of regard in Persia, and for several centuries past the Persian breeds have been esteemed as among the best in the world.

In attempting to trace the migrations of the horse from these central portions of Asia, which we may regard as its birth-place, to Northern Europe, and especially to England, where at present the finest race exists, we have no certain and steady lights. The Romans were never an equestrian people. Cæsar made his immense conquests in Gaul without cavalry. Soon after this period mounted troops were common in the Roman armies, but they were chiefly supplied by the provinces. Whatever attention was paid to the breeding of horses among the Romans, no race of any celebrity was ever produced in Italy. In their boundless conquests, however, they collected the finest breeds, and doubtless some of them were sent to Britain, which may, in some degree, have modified the original stock, which existed in large numbers in the island at the time of Cæsar's invasion.

But whence these original British horses? The answer to this inquiry has been various: some insist that these animals were indigenous to Britain; others that they came from the Levant in that trade which is known to have existed between the British Islands and the Phœnicians first, and the Carthaginians afterward, beginning as far back as the time of Homer. The first of these assumptions may be dismissed with the single remark that it is contradicted by tradition and history, both of which point to the East as the birth-place of the horse as truly as the birth-place of man; the second is set aside by the fact that not Britain only, but the Celtic, Belgian, and German tribes of the continent had horses at the time of Cæsar's invasion.

The truth doubtless is, that Europe has been supplied with their breeds of this noble animal in two great streams; first, the various tribes that peopled these regions—Cimbri, Celts, Saxons, Teutons, Huns, all proceeding from the great central plateau of Asia, which abounded in horses from the earliest times—no doubt took their native breeds with them. These populations passed into Europe, some to the north and some to the south of the Caspian Sea, and eventually spread themselves from Gaul to Scandinavia. Here, in the course of ages, partly through the influence of blood, and partly, also, through the power of climate, feeding, and training, the established northern varieties of the horse—all, however, of a large and sturdy character—were produced and established.

It appears from abundant historical evidence that at a very remote date the eastern part of Asia Minor, and especially Cappadocia, was a renowned mart for horses. This latter province lies contiguous to Armenia and Mesopotamia, and in fact was nearly in the center of those re-



THE CRUSADERS: KING RICHARD AND THE SARACENS.

gions of Asia renowned for horses from time immemorial. Choice animals were doubtless gathered here alike from the wide steppes of Scythia and from Media, Armenia, &c.; and were brought to the sea-coast and distributed by the ships of Tyre and Sidon to various countries around the Mediterranean Sea. Greece and Egypt, we know, received a portion, and perhaps all their horses, from this source. While the horses of the northern migrations into Europe—fed on rich pastures and subject to a rigorous but stimulating climate—became robust, ponderous, and powerful, those of the more southern migration became light, graceful, and spirited. The armies of the Saracens, by conquest and pillage, became filled with these breeds, and in due time—that is, from the seventh to the tenth century—under the influence of the Caliphs, the renowned Arab race was founded. The difference between the horses produced from these two sources—that is, between those of Northern Europe and those of Western Asia—is well displayed by the difference between the horses of the Crusaders and those of their enemies, when they met in Syria. The horse of a northern knight would have crushed a solid column of Moslem cavalry. In fact, Richard Cœur de Lion, with seventeen knights, rode in front of sixty thousand Turkish horsemen at Jaffa from the right to the left wing, and brandishing his lance, defied them to combat, without finding an adversary who dared to encounter him.

While thus the original British horse was of this northern breed, it appears that it has for two thousand years been subject to infiltrations of the Asiatic stock. It is by no means improbable that horses were sometimes brought to England by the Phœnicians in that trade which we know to have existed for several centuries prior to the Christian era, and to which we have already alluded. The Romans also, during the five hundred years in which they held sway in Britain, doubtless introduced eastern breeds. It is also probable that the British Crusaders brought some Arab horses home with them. Spanish horses with Arabian blood have been frequently imported



A COSSACK TROOPER OF THE DON ON HIS MARCH TO PARIS.

into England for the last four hundred years. And finally, since the time of James I.—that is, for two hundred and fifty years—the very best horses and mares that Arabia, Persia, and Barbary could produce have been brought to England and bred with the best English stock. All this has been done with the advantage of unbounded wealth, and the use of the most profound and persevering skill, directed to the single object of bringing the horse to the highest pitch of perfection of which it is capable. The result of all this is to be found in the finer British breeds, of which the *Race-Horse* is considered the highest type. The history of the British horse is therefore analogous to that of his master: both are the produce of a diversified crossing from two great streams of migration, one northern and one eastern, but both proceeding originally from the great central nursery of men and horses, and both improved by the amalgamation.

In order to comprehend how it is that such distinct and remarkable breeds as we have mentioned have proceeded from the same original stock, we need but reflect upon a few notorious facts. The first is, that climate and food have a powerful influence in modifying the size, form, and character of animals. Accordingly, we see that the horse bred for a series of ages in the mountains of Wales, or amid the rocks of the Shetland Isles, or in the chill atmosphere of Sweden and Norway—and thus subjected to a harsh temperature and stingy fare—dwindles into a pony. The same animal on the steppes of Tartary and Siberia, fed on coarse herbage, and sweeping in wild herds over almost illimitable plains, becomes coarse and shaggy in form and covering, but at the same time possessing a remarkable tenacity and vigor of life and character. A living example of the Tartar breed, thus modified, was made familiar to Europe by the Cossacks of the Don who, accompanying the Russian armies in their march which ended in the overthrow of Napoleon—poured like an avalanche upon Southern Europe, and finally bivouacked in wild hordes in the delicious gardens of Paris. We can easily see from these instances how it is that amid the ample pastures of Middle Europe we should, in the breeding of centuries, obtain such large and powerful races as those of Hanover, Flanders, and Normandy, and also how it is that in the fine, pure, spiritualizing atmosphere of Arabia and Syria we should, in the course of ages, obtain the light,

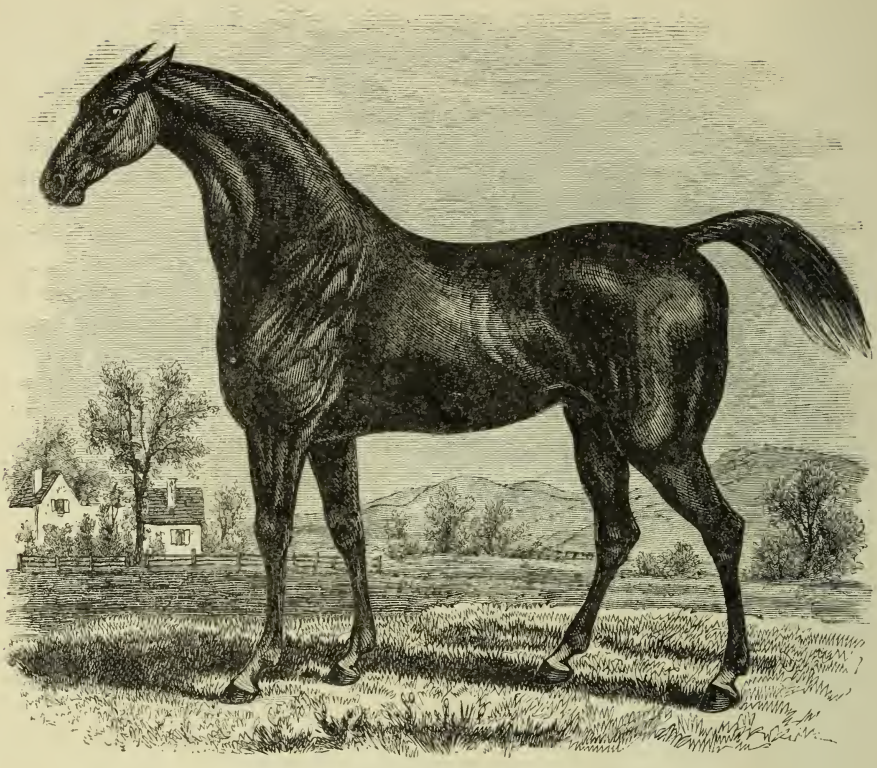
fleet, graceful race which we call Arabian. Just as we find the sturdy German, the stout Dutchman, the athletic Englishman, occupying the rich soil of Middle Europe, and the thin, lithe, elastic Arabian the plains and deserts of Africa and Asia, so we find the horses of these two sections of the earth—the one large, ponderous, and powerful, and the other light, swift, and elastic.

Thus, mainly by the influence of climate and its accessories of food, the various races of the horse are spontaneously produced. There is, however, another principle at work, which lies at the foundation of all the operations of nature, the object of which is to break the uniformity of kinds and races by an infinite diversity in individuals. The wisdom of this system, and its admirable balance in the vast scheme of universal creation, may well excite our admiration, if indeed it does not call upon us to kneel in awe before its Omnipotent and Omniscient Author. It is a common observation, even with children, that amid the myriad grasses of the field two blades precisely alike in size, tint, and form, cannot be found. Two leaves among the millions that flutter in the forest, in all things the same, are never discovered. Two lilies or two roses, even on the same stem, identical one with another, cannot be found. As between two sisters, twins if you please, even while the common lineaments of the father or mother show the golden links of relationship that bind their hearts together, there will be something of form, air, attitude, expression, to distinguish them; so, between these flowers there will ever be a difference, open and palpable to observation. This difference, let it be remembered, in the works of nature, is the foundation of our interest in them. Were all things alike, they would neither excite curiosity nor attract regard. Were all the children of a family precisely alike, they would be objects of comparative indifference. It is the special speech, look, air, tone, manner of each, around which our interests and affections cluster. It is an old adage, that variety is the spice of life. Without variety, life would be a blank. Everywhere it is produced, for everywhere it fixes the attention, stimulates curiosity, and excites admiration. The principles or provisions of nature to produce it are universal, and lie at the foundation of all existence. Hence variety is not superficial: it exists in the sap of plants and the blood of animals. It is in both so blent with life as to be transmitted to the offspring, and thus to spread over the face of nature a never-ending diversity.

Nor is this the whole of that wonderful system of nature to which we allude. Beyond the common diversities of individuals among animals, and especially those of the higher and finer organizations, it is provided that instances of prominent and remarkable constitutional endowments shall arise from time to time, not only to diversify the species, but to counteract the tendency to declension through commonness and impurity, and thus to maintain and exalt the race by the descent of superior blood. Through this provision it is that such instances occur as Bucephalus in the olden time, and Flying Childers, Eclipse, and Highflier in more modern ones. And finally, we may remark that it is by the careful application of the principle here laid down—that these superior animals stamp their character, in a greater or less degree, on their offspring—that the artificial breeder seeks to improve and perfect the horse. The finest examples which nature produces are selected, and as in the main like produces like, so in a course of years, by the union of chosen specimens, a whole generation or *breed*, combining all the possible perfections of the race, is obtained.

THE THOROUGHBRED, OR RACE-HORSE.

This is in fact the history of the English Horse, which, according to the testimony of the best judges, takes precedence of all others in strength, speed, and power of endurance, and also for the capacity of perpetuating its own qualities in its offspring. This superiority is manifested in various ways, and especially by beating in all trials, not only the best Turks, Arabs, and Barbs with which it comes in competition, but even winning, of late years in all cases, where the best Eastern blood had been crossed with its own, and thus proving that neither Barb, Turk, nor Arabian is equal to the English thoroughbred. A curious and interesting reason for this superiority is found in the fact that the bones of the thoroughbred horse are more solid and compact than those of any other kind. The bones of the cart-horse, or indeed any other, are comparatively porous, light, and spongy. The shank-bone of a thoroughbred will weigh down that of the heaviest cart-horse, though in size the former is only half equal to the latter.



FLYING CHILDERS.

Among the most celebrated English thoroughbreds was *Flying Childers*, named from its owner, Mr. Childers, of Carr House. He was the fleetest horse of his day, and is said to have run a mile in a minute, but of this there is no authentic record. He, however, ran on the Newmarket course three miles six furlongs and ninety-three yards in six minutes and forty seconds. This celebrated animal died in 1741, at the age of twenty-six. The English *Eclipse* was never beaten, and won for his owner more than a hundred thousand dollars; he also became the progenitor of three hundred and thirty-four winners upon the turf, which won for their proprietors nearly a million of dollars. Eclipse died in 1789, at the age of twenty-five. The names of horses of more modern date renowned on the English turf are "too numerous to mention."

Beside the Thoroughbred Horse there are a number of varieties of great celebrity in England. Among them we may mention the *Hunter*, which is derived from horses of entire blood, bred with mares of substance, correct form, and good action. This animal is able to carry a considerable weight, through heavy grounds, with a swiftness and perseverance truly astonishing. The *Irish Hunter*, the *Old English Roadster*, and the *Cob*, are all useful breeds for the saddle. The *Hackney* for the coach, the *Black Horse*, the *Suffolk Punch*, the *Lanark* and *Clydesdale* for draught, are noted and favorite varieties. The *Cleveland Bays* formerly had great reputation for draught, but they are said to have depreciated. In England the horse is used for almost every purpose of draught and burden on the farm, and hence the humbler breeds for this species of work are scarcely less cultivated than those for the race-course and the chase. The *Welsh Horse* is small, but is noted for its energy and perseverance upon the road. The *Galloway* is a Scotch breed, somewhat larger than the preceding, but of similar qualities; it is said to resemble the Spanish horse. The *Ponies* or *Shelties*, called *Garrons* in the Highlands of Scotland, are similar to the indigenous horses of Norway, the Feroe and Shetland Islands, and Iceland; they are of various sizes, from eight to twelve hands high; their colors are bay, dun, and sometimes cream-color. A similar breed is also found in Corsica.



THE SCOTCH PONY.



THE ENGLISH FARM-HORSE.

OTHER EUROPEAN BREEDS OF HORSES.

France abounds in horses, probably having a greater number than any other European nation*

* The following is an estimate of the horses of Europe:

Great Britain and Ireland	2,500,000	Denmark	900,000
France	3,000,000	Sweden and Norway	550,000
Austrian Empire, exclusive of Italy	2,600,000	Russia	3,500,000
Prussia	1,600,000	Greece	100,000
Other German States	2,f00,000	Spain	1,500,000
Italy	1,500 000	Portugal	300,000
Switzerland	250,000	Turkey	800,000
Belgium	400,000		
Holland	420,000	Total	22,420,000

The general estimate has been eight to ten horses in Europe for every one hundred inhabitants; supposing the population 275,000,000, this calculation gives a little more than eight horses to one hundred inhabitants. Denmark has forty horses to one hundred inhabitants, which is more than any other European nation. The following is an estimate of the horses of the whole world:

Europe	22,420,000	Other parts of America	1,500,000
Africa	3,000,000	Oceanica	500,000
Asia	25,000,000		
United States	5,000,000	Total	57,420,000

except Russia. Great pains have been taken, as well by the government as by individuals, to produce improved breeds. Napoleon imported over two hundred of pure Arabian blood for this purpose. Yet, though France has a great variety of local breeds, she has none of general celebrity, and is obliged constantly to import considerable numbers. A great many for the saddle and light harness are obtained from England; a still larger number for the cavalry are procured in Germany and Denmark. The most noted French breeds are the *Limousin*, good for the saddle; the *Normand*, especially those from the district of *Cotentin*, a vigorous and hardy race, excellent for the cart, wagon, hack, and diligence; and the *Boulogne*, a noble breed, large, powerful, and adapted to heavy draught. Small but serviceable *Nags*, called *Bidets*, are produced in Auvergne, Poitou, and Burgundy.

The *Horses of Holland*, especially those of Friesland, have long been valued for light draught work.

The *Flemish Horses*, though they have been much used for cavalry in Europe, have heavy heads, large necks, and large, flat feet.

The *German Horses* are of various kinds. The native breeds are heavy and ill-formed, but the introduction of Arabian, Turkish, Barbary, and Spanish horses have produced some finer varieties. The *Mecklenberg Horses* are largely exported to France, where they are used as well for carriage as for cavalry service.

Denmark, with *Holstein* and *Oldenberg*, boast a large variety of horses, greatly esteemed and extensively used for cavalry, though they fail in elegance and symmetry.

The *Norway* and *Swedish Horses* are small, but strong, active, and hardy. Those of Lapland are similar, but still more diminutive.

Prussia has many horses, but the only breed of note is one resembling that of Friesland, produced in the low country near the mouth of the Vistula.

The native horses of *Poland* are of middling stature, and peculiarly hardy, strong, and useful.

The *Transylvanians* have good horses, and are accustomed to slit the nostrils of those used for war, under the idea that, as the horse only breathes through its nose, this gives him a freer breath. It also renders him incapable of neighing, which is often inconvenient in the field.

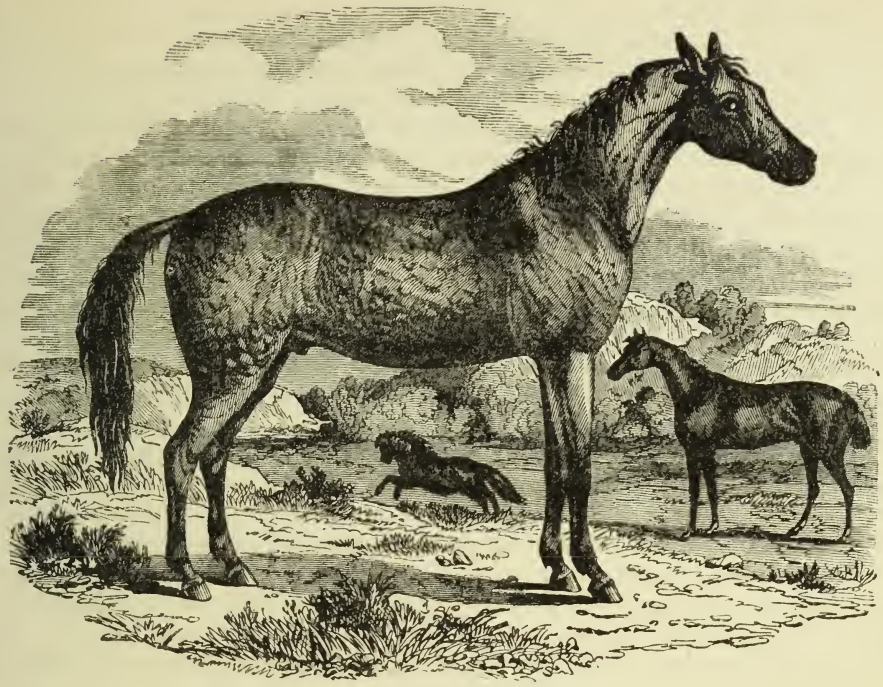
The *Hungarian Horses* resemble the Cossack breeds, and are noted for spirit and endurance.

In *Russia* the horses are of various breeds, but they have no general celebrity. *Trotting-horses*, for matches on the snow and ice, are much valued and cultivated. The *Turkish breed*, which is finely formed, light, and graceful, is in use. The *Kalmuck breed*, which is the same as the *Cossack*, is of prodigious hardiness. Loudon says they will travel three hundred to four hundred miles in three days; they subsist, summer and winter, solely upon the grass of the great plains between the Don, Volga, and Yaik Rivers. Here they abound, the herds numbering from two hundred to a thousand. They are excellent swimmers, and often cross the Volga where it is a mile or even two miles in width.

The *Spanish Horses* have long been celebrated, especially those of Andalusia. They are the result of a strong influx of Eastern blood, at the time of the conquest of Spain by the Moors or Saracens, at the beginning of the eighth century, operating upon breeds already highly improved. The occupation of the country by these invaders for nearly eight hundred years, during which time a constant intercourse with the East was maintained, caused the horses of Spain, especially in the south, near the center of the Moorish kingdom, to become highly Arabianized. This blood still remains, and hence the Spanish horse is greatly valued. For two or three hundred years this breed has been frequently taken to England, France, Holland, and Germany, and has largely contributed by mixture to improve the horses of these countries.

The *Portuguese Mares* were once celebrated for being fleet and long-winded, but they are said to have degenerated.

Italy at present produces no breed of note; the *Horses of Naples* were once highly valued, but have lost their celebrity. The country, however, produces a large number of these animals.



THE ARABIAN HORSE.

ASIATIC AND AFRICAN BREEDS.

The *Arabian Horse*, according to our theory, is a race which sprang up among the Saracens after the seventh century. The vast country which lies east of the Caspian Sea, the ancient home of the Scythians and the site of modern Tartary, we suppose to have been first overspread by the horse. From this point we conceive it to have been extended southward into Persia, Media, Armenia, and Asia Minor, and northward and westward into Siberia and Europe. Cappadocia, contiguous to Scythia, was anciently the most noted horse-market in the East: from this region we are told that the Greeks obtained their horses, or a part of them, and a curious confirmation of this is found in the Elgin marbles, the horses of which have in their outline, and especially their head, a wonderful resemblance to the Tartar horses of the present day. Egypt, directly or indirectly, we suppose to have received its horses from the same source.

The finest of the Tartar horses, thus transported through the markets of Asia Minor to the civilized and luxurious countries lying around the entire borders of the Mediterranean Sea, influenced for ages alike by climate and breeding, resulted in spreading over those countries a race of animals of the highest order of beauty in form, and the most excellent in all other noble qualities. The followers of Mahomet, between the years 632 and 640, conquered the whole of Arabia, Syria, Persia, and Egypt. They made spoil of every thing that came in their way; the finest breeds of horses in the world were thus at their disposal, and as they were especially needed, inasmuch as their troops were all or nearly all mounted, and swept over the countries they invaded like a whirlwind, no doubt these animals were greedily accepted. The horse was one of the chief instruments of the amazing success of these restless fanatics. Taught by experience to prize this animal above every other possession, and beginning with the finest breed in the world, and moreover, aided by a pure, elastic, and spiritualizing climate, it is not surprising that the Saracens or Arabs should have produced that race which, all things considered, may be regarded as its finest type. This superiority does not consist in surpassing all others in speed, strength, and endurance, for in these respects it must yield to the *English Thoroughbred*, but in the fact that, while having these qualities in a high degree, in breeding with others it uniformly stamps its progeny with improvement.

The *Arab Horse* is not, perhaps, the handsomest, according to our ideas. Its frontal line is

straight, or even a little concave; the chest is narrow, and the balance is thrown with great equality upon both sets of extremities. But the narrow chest, by means of which the fore-legs are brought much closer to each other, though essential to a swift-running horse, does not adapt the animal for draught. In Arabia, and the other countries where the horse is so much esteemed, this is not considered a deficiency, because the animal is not there used for draught, goods being conveyed on the backs of camels. The skin of the Arab is very fine, the hair smooth, and the form of the muscles and the positions of the veins under the skin very conspicuous. The joints are particularly well made, and those processes of the bones to which the tendons are attached are very prominent, and the joints themselves are generally free from any defect. The limbs are particularly handsome, and have little or no hair on the fetlock. The common height at the shoulder is between thirteen and fourteen hands. The pace of these horses is rapid and graceful; they do not perspire much; they last a long time; they can continue traveling at the rate of from fifty to sixty miles a day; and five or six pounds of *dourra*, or the barley of their native country, in the evening, is a sufficient feed for them. When at home in the tent they are fed with chopped barley-straw.

The wind of these horses is particularly good, and they can be pushed at their full speed for a long distance without injury. They carry their heads, and also their tails, in a very graceful manner. They are divided into *ignoble* and *noble*—the former being doomed to drudge, while the latter are used for the saddle, highly esteemed, and much attended to by their owners. They call the former by a name which means "*without pedigree*," and the latter by another name, which signifies a pedigree which would be venerated anywhere—"*known for two thousand years*." The tradition is, that these horses are descended from the veritable stud of King Solomon, and have not been once crossed or corrupted in the blood since he sat upon the throne in Jerusalem. They are unquestionably noble animals, are held in great esteem, and often are of enormous price. We can understand that among a people so romantic and so poetical in their language as the Arabs the most wonderful stories should be told concerning them. "If," says the Arabian story, "you meet one of the faithful in the desert, mounted upon a *Kochlani*, and he shall say 'God bless you,' before you can say, 'And God's blessing upon you,' he shall be out of your horizon, for the whirlwind toils after him in vain." The same story, however, is told of the camel.

The utmost attention is paid to the breeding of these horses, that they may not be tainted even by accident. The union always takes place in presence of a witness, who remains twenty days afterward to watch the female. The same witness is also present when the colt is cast, and a regular certificate is made out within the first seven days. If these circumstances are not attended to, and the legitimacy cannot be established by the proper certificate, the marketable value of the horse is greatly diminished, whatever may be his real qualities.

In Europe and America particular breeds are chiefly propagated through the male; in Arabia it is considered that the female best transmits the qualities of a race, and hence the blood of the mare is most scrupulously guarded.

The interesting qualities of the Arabian horse are attested by numerous writers. Bishop Heber, in his "Narrative," says: "My morning rides are very pleasant. My horse is a nice, quiet, good-tempered little Arab, who is so fearless that he goes without starting close to an elephant, and so gentle and docile that he eats bread out of my hand, and has almost as much attachment and as coaxing ways as a dog. This seems the general character of the Arab horses, to judge from what I have seen in this country. It is not the fiery, dashing animal I had supposed, but with more rationality about him, and more apparent confidence in his rider, than the majority of English horses."

The kindness with which this animal is treated from a foal gives him an affection for his master, a wish to please, a pride in exerting every energy in obedience to his commands, and, consequently, an apparent sagacity which is seldom seen in other breeds. The mare and her foal inhabit the same tent with the Bedouin and his children. The neck of the mare is often the pillow of the rider, and, more frequently of the children, who are rolling about upon her and the foal; yet no accident ever occurs, and the animal acquires that friendship and love for man which occasional ill-treatment will not cause him for a moment to forget.



THE ARAB HORSE AT HOME.

When the Arab falls from his mare, and is unable to rise, she will immediately stand still, and neigh until assistance arrives. If he lies down to sleep, as fatigue sometimes compels him to do, in the midst of the desert, she stands watchful over him, and neighs and rouses him if either man or beast approaches. An old Arab had a valuable mare that had carried him for fifteen years in many a hard-fought battle, and many a rapid, weary march; at length, eighty years old, and unable longer to ride her, he gave her, and a scimitar that had been his father's, to his eldest son, and told him to appreciate their value, and never lie down to rest until he had rubbed them both as bright as a looking-glass. In the first skirmish in which the young man was engaged he was killed, and the mare fell into the hands of the enemy. When the news reached the old man, he exclaimed that "life was no longer worth preserving, for he had lost both his son and his mare, and he grieved for one as much as the other;" and he immediately sickened and died.

Man, however, is an inconsistent being. The Arab who thus lives with and loves his horses, regarding them as his most valuable treasures, sometimes treats them with a cruelty scarcely to be believed, and not at all to be justified. The severest treatment which the English race-horse endures is gentleness compared with the trial of the young Arabian. Probably the filly has never before been mounted; she is led out; her owner springs on her back, and goads her over the sand and rocks of the desert at full speed for fifty or sixty miles without one moment's respite. She is then forced, steaming and panting, into water deep enough for her to swim. If, immediately after this, she will eat as if nothing had occurred, her character is established, and she is acknowledged to be a genuine descendant of the *Kochlani* breed. The Arab is not conscious of the severity which he thus inflicts. It is an invariable custom, and custom will induce us to inflict many a pang on those whom, after all, we love.

The following anecdote of the attachment of an Arab to his mare has often been told, but it comes home to the bosom of every one possessed of common feeling. "The whole stock of an Arab of the desert consisted of a mare. The French consul offered to purchase her in order to send her to his sovereign, Louis XIV. The Arab would have rejected the proposal at once with indignation and scorn; but he was miserably poor. He had no means of supplying his most urgent wants, or procuring the barest necessaries of life. Still he hesitated; he had scarcely a rag to cover him, and his wife and children were starving. The sum offered was great—it would provide him and his family with food for life. At length, and reluctantly, he consented. He brought the mare to the dwelling of the consul—he dismounted—he stood leaning upon her; he looked now at the gold and then at his favorite; he sighed—he wept. 'To whom is it,' said he, 'I am

going to yield thee up? To Europeans, who will tie thee close—who will beat thee—who will render thee miserable. Return with me, my beauty, my jewel, and rejoice the hearts of my children.' As he pronounced the last words he sprang upon her back, and was out of sight in a moment."*

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* The following are extracts from a paper on the Arabian Horse, recently addressed by the Emir Abd-el-Kader to General Daumas, who had made inquiries of him, on the part of the French government, in relation to the Arabian Horse:

CREATION OF THE HORSE.

"Know, then, that it is a thing admitted among us, that God created the horse with the wind, as Adam with the earth.

"This is indisputable, and many prophets (health to them!) have proclaimed the following:

"When God wished to create the horse, he said to the south wind, 'I wish to form a creature out of thee—be thou condensed;' and the wind was condensed.

"Afterward came the angel Gabriel, and took a handful of that matter and presented it to God, who formed of it a light brown or sorrel-colored horse, *koummita* (red mixed with black), saying:

"'I have called thee horse (*ferass*), I have created thee an Arab, and I have given thee the color *koummita;* I have bound fortune upon the mane which falls over thine eyes; thou shalt be the lord of all other animals; men shall follow thee whithersoever thou goest; good for the pursuit as for flight—thou shalt fly without wings; riches shall repose in thy loins, and wealth shall be made by thy intercession.'"

HISTORY OF THE ARABIAN BREED.

"Many historians relate that from the time of Adam the horse, as all other animals—the gazelle, the ostrich, the buffalo, and the ass—had lived in a wild state. According to them, the first person that, after Adam, mounted the horse, was Ishmael, the father of the Arabs; he was the son of our lord Abraham, the beloved of God. God taught him to call the horses, and when he did so they all assembled unto him; he possessed himself of the most beautiful and the most fierce, and he tamed them.

"But later, many of these horses tamed and employed by Ishmael lost their purity with time. Only one race was carefully preserved in all its nobleness, by Solomon the son of David, and it is that which is called *zad-el-rakeb* (the gift of the rider), to which all the Arab horses of our epoch owe their origin.

"It is believed that some Arabs, of the tribe of Azed, went to the noble Jerusalem to congratulate Solomon on his marriage with the Queen of Sheba. Their mission being ended, they addressed unto him these words:

"'O prophet of God! Our country is very distant, our provisions exhausted; although thou art a great king, give unto us sufficient that we may return to the bosom of our family.'

"Solomon caused a magnificent colt of the race of Ishmael to be taken from the stables, and he dismissed them, saying:

"'Behold the provisions with which you are to be refreshed upon the journey. When you are hungry, search for wood, kindle a fire, mount your best rider on this horse, and arm him with a trusty lance. You shall scarcely have collected the wood and enkindled the fire ere you shall see him appear with the product of an abundant hunt. Go, and may God give you his protection.'

"The Arabs set forth upon their journey, and did, in their first necessity, whatsoever Solomon had instructed them, and neither zebras, nor gazelles, nor ostriches could escape them. Enlightened, then, concerning the value of that animal—the present from the son of David—and being already in their country, they devoted themselves to their reproduction, guarding their matches, and thus they obtained this race, to which, in gratitude, they gave the name of *zad-el-rakeb.*

"This is the race whose fame was afterward spread throughout the whole circumference of the world.

"In fact, it was propagated in the East and West with the Arabs, who, at a later time, penetrated into the extremities of the West and of the East. Long before Islamism, Harmiah-Ahen-Melok and his descendants reigned in the East during a hundred years, founding that Medina and Sakliachedad-Eben-Aad, and possessing themselves of all the country unto the Moghreb, where they built cities and harbors. Afrikes, who gave his name to Africa, conquered unto Tandja (Tangiers), while his son Chamar possessed from the East unto China, entering the city of Sad, which he destroyed. Because of this, and from that time, that place was called Chamarkenda, because *kenda* in the Persian language means 'he has destroyed,' whence the Arabs, by corruption, have drawn Samarkanda.

"After the birth of the religion of Islam, the new invasions of the Mussulmans extended even more the reputation of the Arab horses in Italy, Spain, and also in France, in which, without doubt, they left some of their blood. But that which, above all, caused Africa to be filled with Arab horses, was the invasion of Sidi-Okba, and afterward the deeds of the fifth and sixth centuries of the Hegira. With Sidi-Okba, the Arabs had not done any thing more than to encamp in Africa, while in the fifth and sixth centuries they came as colonists to install themselves, with their wives and their children, with their horses and their mares. It was in these last invasions that the Arab tribes established themselves on the soil of Algeria, especially the Mehall, the Cjendel, Oalad-Mehadi, the Donaonda, &c., &c., who were scattered over all parts, constituting the true nobility of the country. These same invasions transplanted the Arab horse into Soudan, and we can say with reason that the Arab race is one in Algeria as in the East.

"Thus, then, the history of the Arab horses can be divided into four epochs: 1. From Adam to Ishmael. 2. From Ishmael to Solomon. 3. From Solomon to Mohammed. 4. From Mohammed to ourselves.

"I have now nothing more to do than to satisfy another of your questions.

"You ask me by what signs the Arabs know if a horse is noble—if he is a drinker of the air. Behold my answer:

"The horse of pure origin is distinguished among us by the tenuity of the lips and of the inferior cartilage of the

The *Barb* is an animal of the Arab stock, bred by the Moors, in *Barbary*, whence its name. It was this variety, no doubt, that was introduced into Spain by the Moors. Some authors have been disposed to trace this animal to a remote African lineage, an indigenous animal of the deserts, used by the nomadic Moors and Arabs as far back as the time of Hannibal, and supplying the ranks of the Numidian cavalry in his service. We need but say that while there is no historical authority for this, we have direct testimony to the fact that the Moorish or Barbary horses which were taken to Spain were of Arabian descent. In general, the Barb is considered as possessing the high qualities of his race in a degree scarcely inferior to the Arabian. It is not handsome, its head being large, its neck short and thick, the body and legs long and slender; yet its speed, bottom, abstinence, patience, and perseverance are unrivaled.

The horse is a common animal in the Barbary States, and indeed throughout many parts of Africa, especially among the Arabian portion of the population. It is almost exclusively used for the saddle, the camel being employed for the transportation of merchandise, and the ass for carrying burdens in the common affairs of the house and farm. Some of the negro princes of Africa have horses, and often of fine breeds. Major Denham found the little State of Begharmi, in Central Africa, to possess a body of well-mounted cavalry, and both men and horses covered with linked iron mail! There are also, as we are told, wild horses in Africa, and some authors, as we have elsewhere stated, regard this as the original home of the horse. History, it is true, informs us that Egypt was possessed of well-trained horses about the time of Joseph, but not in the time of Abraham, two centuries before. If the horse was a native of the contiguous deserts, how did it happen that for many centuries after Egypt had reached a high pitch of civilization the horse had not been brought into use? And beside, many circumstances already noticed point to the Scythians as the first horsemen, and Scythia as the birth-place of the horse.

The *Persian Horse* is evidently a cross with the Arabian, but in which way or with what breed is unknown. According to our ideas, its head is handsomer than that of the Arab, and it is a more weighty animal, but it wants the spirit and continuity of exertion which are so characteristic of the other. For short distances these horses are nearly, if not altogether, as fleet as Arabians, but they have not equal wind. The Persians, however, pay great attention to purity of blood in their best horses, and in former times the horses of England were much improved by the introduction of some stallions from Persia. The racer bred by crossing with these was once greatly celebrated for its swiftness on the turf, though, since the pure Arabian blood has been introduced, the race-horse is vastly superior to what it was.

The *Turkish Horse* is a fine animal, and resembles the Arabian; it is used almost exclusively for the saddle.

The *Tartar Horse* is spread over the present Independent Tartary and the adjacent countries, extending through a space of nearly ninety degrees of longitude, that is, from Mantchooria to the Ukraine; it presents considerable variety, according to the climate; yet, with singular persistency

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nose; by the dilatation of the nostrils; by the dryness of the flesh which enwraps the veins of the head; by the elegance of its shape; by the softness of the mane, of the extremities, and of the skin; by the width of breast, the thickness of the articulations, and dryness of the extremities. According to the traditions of our predecessors, they are, also to be recognized by moral indications much more than by external signs. By these you can prejudge the race; by the moral indications you can arrive at a knowledge of the care which had been observed in the matches (breeding), of the interest with which crossing had been avoided.

"The horses of race do not know effeminacy. The horse is the most beautiful of animals, and its moral, in our idea, ought to correspond, not degenerate, to its physical character. The Arabs have such a conviction of this, that if a horse or a mare gives any incontestable proof of extraordinary quickness, of notable abstinence, of rare intelligence, or affection for the hand that gives it its food, they will make every possible sacrifice to draw a race from it—being persuaded that the qualities which distinguish it will be manifested in its breed.

"We believe, then, that a horse is truly noble when to a beautiful conformation it unites valor and fierceness, and when it evinces pride in the smoke of powder and the combat.

"This horse will esteem its master, and will scarcely ever permit any one to mount it except him. It will not urinate while it is traveling. It will not eat the leavings of any other horse. It will not disturb the clearness of the water with its front legs when it passes over it. By its hearing, by its sight, and by its smell, it will know how to preserve its master from the thousand accidents which often take place in the chase and in war. And in short, sharing the sensations of sorrow and of pleasure of its rider, it will aid him in the fight, struggling with him in all parts, and will always make common cause with him."



CIRCASSIANS.

of constitution, it everywhere maintains certain general characteristics, such as a straight or even depressed frontal line,* square nostrils, stout limbs, robust constitution, and great powers of endurance. In China and Japan, where, indeed, few horses are in use, it is dwindled almost into a pony. In Siberia and the contiguous regions of European Russia, that is, among the Baschirs, it is still a small, shaggy, but vigorous species. Among the Tartars proper, whether Usbeks, Turcomans, Kirghis of Asia, or Cossacks of Europe, it is an animal of moderate size and somewhat coarse appearance, but possessed of the sterling qualities which we have ascribed to the race. Many of them which are bred with care are among the most enduring and powerful horses in the world, and by no means deficient in beauty. The Circassians cultivate this breed, and it appears that they are alike distinguished for elegance and vigor. As before stated, the Tartars are excellent horsemen. They bestow upon their favorites the same care and affection which the Arabs lavish on theirs. From early childhood both sexes are accustomed to mount the horse, and thus they become skilled in its management.

Tartary or Scythia we conceive to have been the birth-place of this noble brute; the *Tartar Horse* we regard as the progenitor of the species. Extended into Persia, Arabia, and Egypt, and bred with care for centuries in a pure and elastic atmosphere, it produced the elegant and beautiful Arabian; spread westward through Northern Europe, and subjected to a variety of influences, it became the wild rover of the Don, the heavy but irresistible charger of Flanders, the vigorous wagoner of Normandy, the ponderous cart-horse of Belgium, the shaggy but hardy pony of Norway, Sweden, and Iceland. In Spain, crossed by the Barb, it produced the light, graceful Genet; in England, blent with the Arabian, it reached the climax of the species in the Race-horse.

This animal—the Tartar breed—is found in a wild state in various parts of Western Asia. Along the borders of the Caspian, among the Kirghis tribe, there are droves of many hundreds

* "The Tartar horse is remarkable for the straightness of the frontal line, the squareness of the nose, the wideness of the nostrils, the beard along the under jaw, the general shagginess of the coat, and the length and quantity of hair in the tail. This appears to be the original horse of Eastern Europe, as well as of Western Asia northward of the central mountains; for if the figure of its head is compared with those of the horses on the Elgin marbles, or any other Grecian sculptures of undoubted authenticity, there will be found to be a wonderful coincidence; nor are these characters entirely lost in the Shetland pony, which there is every reason to believe found its way to the Shetland Islands through Russia and Scandinavia."—*British Cyclopedia of Natural History.*



A HERD OF HORSES ON THE BORDERS OF THE CASPIAN, DRIVEN UPON THE ICE.

partially wild, but they are caught and trained to use as necessity requires. This country is subject to terrific winter storms, which sometimes drive these bands upon the ice, and they are destroyed by thousands. In this manner, a few years since, the Kalmuck prince Turaine lost six thousand of these animals; in the winter of 1827, among the Kirghis tribe, no less than three hundred thousand perished by the severity of the season. These facts show the abundance of these animals in those regions; nor are they less numerous in the vast plains which stretch northward from the Crimea to the southern foot of the Ural Mountains. Thus, in its original seats, its ancient heritages, the unbridled horse roams in countless numbers, the descendants of those fi animals which ages ago carried the fierce Scythians in their conquests over half the world.

AMERICAN HORSES.

The continent of America has no indigenous species of the equine family: the Horse were brought hither by the European settlers, and are now dispersed over both North a America. The Spanish breeds of horses were spread throughout the Spanish colonies, of them, escaping from their owners, fled to the wilds, where, in the course of centuries become exceedingly numerous. At the present day, in the vast prairies or pamp America, they roam in large bands, sometimes amounting to thousands; they are in parts of Mexico, and in Texas, and even in our unsettled southwestern territori of Indians in these regions, originally destitute of every species of domestic ani dog and the horse, the latter being caught wild and trained to their use. The nomads of the wilderness which stretches eastward of the Rocky Mountains, the sources of the Red River, the Brazos, and the Colorado—especially, have ar animals, which they use for war and the chase with all the dexterity and hari

WILD HORSES.

In general, it may be said that wild horses have not the fine proportions o ties: they have usually large heads, heavy limbs, and the mane an tail ar In our southwestern territories, where they are constantly hunted by the I exceedingly shy and watchful, and fly upon the slightest alarm, being usuall lion. They avoid thick forests and woody morasses, and seek broad, open p full liberty, a troop of horses sweeping over the plain with

> "Wide flowing tail and flying mane,
> Wide nostrils—never stretched by pain—
> Mouths bloodless to the bit or rein,

And feet that iron never shod,
And flanks unscarred by spur or rod—
A thousand here—the wild, the free—
Like waves that follow o'er the sea"—

is one of the most noble and inspiring scenes presented by the animal creation.

In South America the wild horses are captured with the lasso by the Indians and Guachos, and in a few days are completely broken to the saddle. The same process is adopted in Northern Mexico, and in the adjacent territories of the United States. These horses, thus subjected to the use of man, are exceedingly serviceable; though generally of small size, they are peculiarly hardy and powerful. Those called *Indian Ponies*, which are occasionally brought to the Eastern States, though far from being handsome, are remarkable for endurance, performing an almost incredible amount of labor with moderate fare.

The animals thus civilized are, however, very apt to retain a streak of their native savageness. Occasionally a number of them will be seized with a sudden frenzy, such, no doubt, as is common, and perhaps habitual and constitutional among the wild herds which are often attacked by carnivorous beasts, or assailed by fiercer and more dangerous enemies—the Indian hunters. A panic of this sort, which is not uncommon among the caravans of traders and travelers, who traverse the southwestern deserts with large numbers of horses and mules, is called a *stampede*. Under the influence of one of these paroxysms, all the horses in the troop, and even the mules and oxen, are seized with an uncontrollable madness, and bursting away, spread mischief and confusion on every side. Most frequently these events take place at night, the darkness of course adding to the turmoil and terror of the scene. Often a traveling party is stopped for several days by one of these incidents, it being a matter of great labor to overtake and bring back the scattered animals to their duty.

DOMESTIC BREEDS.

There has been in the United States an earnest endeavor, within the last fifty years, to improve the breeds of our horses, the same methods being generally followed as in England. But it is obvious that the difference of our habits and situation, in several respects, from those of the people of England, must lead to a difference of wants, and consequently to the cultivation of peculiar breeds of horses. In England there is a large number of persons—and those of the highest social position—who interest themselves in the *race-course* and the *chase*, and who bestow a large part of their time and money in these pursuits. Hence the *Racer* or *Thoroughbred*, and the *Hunter*, which is nearly a thoroughbred, stand at the very head of the species, not merely because they have the finest blood, but because they are actively demanded for actual use. In our country breeds are interesting to comparatively few, and these chiefly known by the name of "sporters," exercising little influence beyond their own limited circle. "The uses to which sold in the principal markets of our country are put," says a well-informed writer,*

's valuable and interesting "*Essay on Morgan Horses.*" From that work we extract the following re-
ferent uses of the horse in different parts of our country, as well as the different kinds employed:
horse is found chiefly in the Middle States, but is not as often met with now as formerly. He is
v importations from Flanders and Denmark: he is inclined to be too long in the leg, too light in
ll in his paces. His quarters and shoulders are generally good, and when his body is found
kes an excellent draught-horse; he is often over seventeen hands high.
bred is found in perfection in many of the states, but is bred chiefly at the South. In most
jority of the horses in ordinary use possess traces of racing blood.
is found chiefly in Canada, and is undoubtedly of Norman-French descent, and to this day
degree, the distinguishing traits of the stock from which they sprang. There are many va-
n cros sed with the English thoroughbred. They have maintained the good qualities of their
size, probably owing in a great measure to the rigor of the climate and their scanty fare.
rdy, easily kept, are long-lived, and perfectly gentle and docile. Some of them are celebra-
tances, but as a breed they are not good roadsters.
cer, a breed long celebrated in Rhode Island, but now nearly extinct, is said to have de-
orse import d by Governor Robinson from Andalusia, in Spain. They were noted for their
le, docility, and powers of endurance. They were small and not well adapted for draught.
not yet be n extensively bred in this country, but a few fine animals have been imported.
l sixteen hands high, compact and muscular, and though not adapted to high speed with
ed they are unrivaled in their powers of endurance, carrying a great weight at the rate
ur.

"are hauling omnibuses and hacks, driving in light carriages, and traveling or moving freight from place to place in the larger towns or cities. Some horses are still used under the saddle, but the number thus employed in the United States is comparatively very small, and in New England a person is rarely seen on horseback."

"In addition to these varieties, there are in various parts of the country families claiming more or less alliance to the thoroughbred. Of these, the *Messengers*, the *Hamiltonians*, the *Henrys*, the *Bellfounders*, are perhaps the most noted, as they were generally well-formed, fine-moving, fast-going, and enduring horses.

"The stock descended from Messenger, Hamiltonian, and some others, proved very valuable; many of them were excellent roadsters, and some of them were fast trotters. Hence, it soon became policy for dealers to advertise their horses as descended from those whose stock was known to be good, and at the stables of those dealers whose honesty is not of the adamantine kind, you can usually purchase a horse of any of the well-known families, provided you give a reasonable hint of the stock you prefer. Hundreds of horses are sold every year as Morgans, Messengers, Hamiltonians, &c., who have not a particle of the blood they are represented to possess.

"The observant traveler through the different states of the Union, who possesses any taste for a horse, cannot fail to mark the striking difference in the general character of the horses of different sections of the country. In the New England States he sees a compact, hardy stock of horses, of medium size, with high carriage—good travelers, and extremely gentle and tractable driving-horses.

"In almost every county he may find descendants of the *Justin Morgan*, and in some he will see that they comprise a large portion of the stock. Along the Canada border he will see many specimens of the *French-Canadian horse*, and in some parts of Massachusetts and Connecticut he will see descendants of the *Norman*, the *Flemish*, and the *Danish horse*.

"Throughout New England he will see evidences of the blood of the *English racer* and the *Arabian: Messenger, Dey of Algiers, Hamiltonian, Cock of the Rock, Henry, Post-Boy, Sir Walter, Sir Charles*, and many others, having mingled their blood with the common stock of the country, but the pure thoroughbred he will not be apt to see.

"Passing through New York, we see a greater variety of horses. Within the state may be found individuals exhibiting the form and characteristics of every breed known in this country. As a general rule, the driving-horses—many of them very fine—are taller than those of New England and less compact. The farm and draught-horses are generally larger, but vary much in size, from the *Canadian pony* to the *English cart-horse*. The thoroughbred may occasionally be met with, though not so common now as formerly; but scattered throughout the state may be found the descendants of *Messenger, Eclipse, Henry, Duroc*, and other celebrated horses of that breed. In the central and northern parts of the state may be seen some of the descendants of the Justin Morgan, some of these horses having been taken there within the past few years.

"As we pass through Pennsylvania and Ohio we observe a more striking change in the character of the horses. The fine driving-horse is more rarely seen. The farm and draught-horses are much larger, and sometimes are really immense. They are descended from the *Flemish* and *Danish horses*, are usually fat, slow, and awkward, are sometimes pretty well formed, but are inclined to be leggy and loosely built.

"In the eastern part of Pennsylvania and northern part of Ohio many fair driving-horses may be seen, but in the western part of Pennsylvania and southern part of Ohio good buggy-horses are not common—light wagons are not much used. Many good saddle-horses may be found possessing more or less of the characteristics of the English thoroughbred, a good specimen of which may occasionally be seen.

"As we go west and south we find the good buggy-horse becoming more and more rare, and the number and quality of the saddle-horses constantly increasing; until arrived in Kentucky and Tennessee the former is not often seen, while the latter are both numerous and excellent.

"Many of the draught and carriage-horses used in Kentucky are brought from Ohio and Indiana, and are taken from the stock of those states, the coarsest being used for draught and the finest for the carriage.

"The horses in common use for farm and similar work are decidedly inferior. This is, perhaps, in a great degree, due to the fact that a large number of the best mares are constantly used for breeding mules, and that more attention is paid to raising the latter animals, which have become one of the great staples of Kentucky.

"Throughout the remaining Southern States the animals used upon the farm and road are principally mules; light wagons are but little used; the white population is more thinly scattered, and though most of the planters keep a family carriage, yet the ordinary business travel is principally upon horseback. Throughout the Southern States the English thoroughbred is found in high perfection, and many of the horses in common use partake largely of his blood.

"The horses of Indiana, Illinois, and the other Western and Northwestern States, closely resemble the horses of Ohio, and in fact, many of them were raised in that state, and taken farther west by persons emigrating to new lands.

"Although emigration has been going on for some time from New England to these states, yet, until within the last few years, the emigrants very rarely took any animals with them, the journey being too long to be undertaken with teams; but the emigration to that country from Ohio, Pennsylvania, and Virginia, has very generally been made in wagons, the emigrants taking their horses with them.

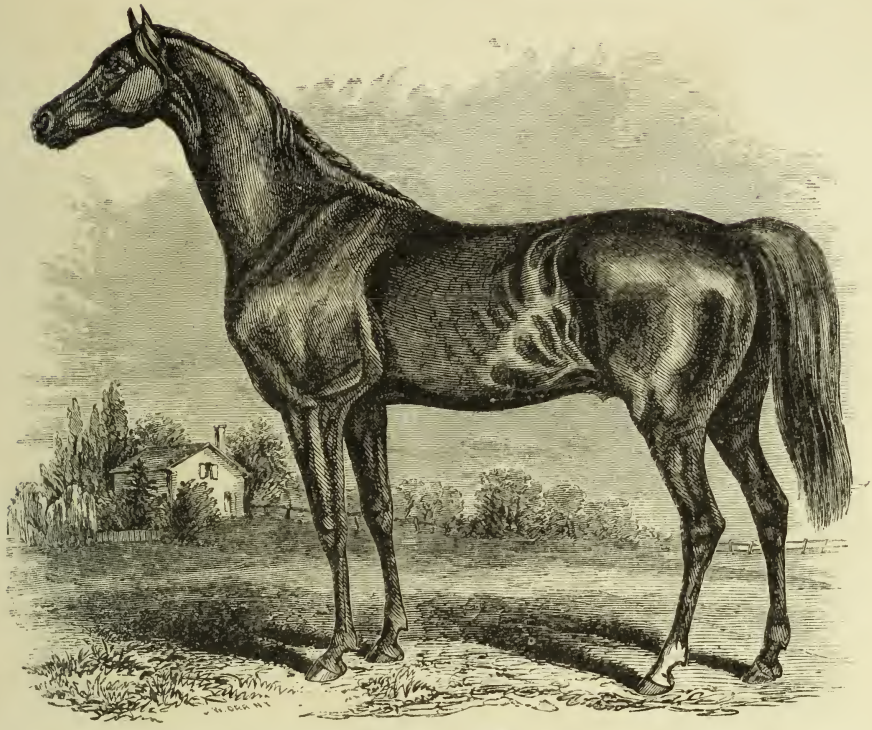
"Within the last few years a few *Morgan horses* have been taken into that section, where they command high prices; and as they become more and more known, so the demand for them is steadily increasing, and in passing through the large towns the traveler will occasionally see a good specimen of the race.

"It is a fact worthy of note that the English thoroughbred is found most numerous, and in the greatest perfection, in those states where the saddle-horse is most in demand, and where the light buggy has not yet come into very general use; while in those states where the horse is little used under the saddle, but almost entirely in harness, he is not often met with."

It is obvious, from these facts, that animals of a substantial and steady character are those most in demand among us. From the general use of light wagons, however, the *Trotting-Horse*, adapted to the whirling of these with swiftness over the road, has become a matter of fancy among us, and animals of this kind take somewhat the same place on the American turf as the race-horse does on the turf of Great Britain. The *American Trotting-Horse* has in fact acquired a European reputation, and the *Trotting-Match* has been transplanted from this country to England, France, and some other foreign countries. The names of celebrated American trotters are altogether too numerous to mention. In the published list of winners for the year 1856 alone, we find no less than four hundred! That year *Lady Flora* trotted a mile in two minutes twenty-four and a quarter seconds, which is the best time on record. This celebrated animal won thirty-nine races in six years, losing eight; her winnings amounted in all to $46,850. A mile under two minutes and forty seconds is considered good trotting. *Tacony* has done it in two twenty-five and a half; *Lady Suffolk* in two twenty-six and a half; *Aggy Down* in two twenty-seven, and *General Taylor* also in two twenty-seven. In 1841 *Fanny Jenks* did ten miles in twenty-nine minutes fifty-nine seconds; in 1846 *Fanny Murray* did one hundred miles in nine hours, forty-one minutes, twenty-six seconds; in 1850 *Kate* did one hundred miles in nine hours forty-five minutes.

Nor have we been altogether without noted examples of excellence in the race-horse. In May, 1823, three heats of four miles each were run over the Union Course, on Long Island, for a stake of twenty thousand dollars, by *American Eclipse* and *Sir Henry*. The former was regarded as representing the North and the latter the South. The fame of the horses, and the local pride elicited by the nature of the competition, drew an immense number of spectators—sixty thousand at least. Indeed, the match excited a sort of national feeling, and the result was looked for not by sportsmen only, but by the great mass of the American public, with an impatient interest. We have only space for a single extract from the description of this renowned race by an eye-witness. It relates to the second heat:

"The horses, after a lapse of thirty minutes, were called up for a second heat. I attentively viewed Eclipse while saddling, and was surprised to find that, to appearance, he had not only entirely recovered, but seemed full of mettle, lashing and reaching out with his hind-feet, anxious and impatient to renew the contest. Mr. Purdy, having mounted his favorite, was perfectly at home and self-confident. The signal being again given, he went off rapidly from the start; Sir Henry being now entitled to the inside, took the track and kept the lead, followed closely by Eclipse, whom Mr. Purdy at once brought to his work, knowing that game and stoutness was his play, and his only chance of success that of driving his speedy adversary up to the top of his rate without giving him the least respite. Henry went steadily on, nearly to the top of his speed, keeping a gap open between himself and Eclipse of about seven-eighths, or until, toward the conclusion of the third mile, they had arrived nearly opposite the four-mile distance-post. Here Mr. Purdy made his run, and when they had advanced forty yards further, which brought them to the end of the third mile, was close up, say nose and tail. They now entered upon the fourth and last mile, which commences with a turn or sweep the moment you leave the starting-post. Here the crowd was immense. I was at this moment on horseback, stationed down the stretch or straight run, a short distance below the winning-post, in company with a friend, J. Buckley, the jockey, who kept close to me during the whole race. We pushed out into the center, or open space of the ground, in order to obtain a more distinct view of the struggle which we saw making for the lead; every thing depended upon this effort of Purdy; well he knew it; his case was a desperate one and required a desperate attempt; it was to risk all for all; he did not hesitate. When the horses had got about one-third of the way round the sweep, they had so far cleared the crowd as to afford us a distinct view of them a little before they reached the center of the turn; Eclipse had lapped Henry about head and girth, and appeared evidently in the act of passing. Here Buckley vociferated, 'See Eclipse! look at Purdy! By heavens, on the inside!' I was all attention. Purdy was at the left hand or inside of Henry; I felt alarmed for the consequence, satisfied that he had then hazarded all, and feared that Walden would take advantage of his position, and by running in, force him against or inside one of the poles. When they had proceeded a little more than half-way round the sweep, the horses were a dead lap; when about



AMERICAN ECLIPSE.

three-fourths round, Eclipse's quarter covered Henry's head and neck, and just as they had finished the bend, and were entering upon the straight run, which extends along the back part of the course, Eclipse, for the first time, was fairly clear and ahead. He now, with the help of the persuaders, which were freely bestowed, kept up his run, and continued gradually, though slowly, to gain during the remaining three-quarters of a mile, and came in about two lengths ahead. As they passed up the stretch, or last quarter of a mile, the shouting, clapping of hands, waving of handkerchiefs, long and loud applause sent forth by the Eclipse party exceeded all description; it seemed to roll along the track as the horses advanced, resembling the loud and reiterated shout of contending armies."

We need but add to this animated description the simple statement, that on the third heat, after a desperate struggle, Eclipse was triumphant. Thus ended the most interesting race ever run in the United States. The three heats, or twelve miles, were performed in twenty-three minutes fifty and a half seconds; beside the original stakes of twenty thousand dollars, two hundred thousand dollars changed hands. From this time Eclipse was the undisputed champion of the course; he lived to the age of twenty-five, having died in the year 1839, and having been the progenitor of a large number of animals, among which are many of the most celebrated runners in the annals of the turf.

But it must be admitted, despite these facts, that the impression extensively prevails in this country that there are native breeds among us better adapted to the wants of the country than even the thoroughbreds of England. It is perfectly well known that a large part of these animals are really very indifferent beasts, and that it is only here and there one that actually rises to that pre-eminence which is claimed for the race. It is not surprising, then, that such a breed as that of the *Morgan Horse*,* described as an "*untiring, all-day horse*," should become a favorite

* The origin of this breed is called the *Justin Morgan*, from its owner, Justin Morgan, of Randolph, Vt. It was foaled in 1793, and was probably sired by *True Briton*, or *Beautiful Bay*, an animal stolen from Col. Delancy at Kingsbridge, near New York, True Briton having been sired by the English horse Traveler. The dam is not known. Though probably descended from an English sire possessing some thoroughbred blood, still this animal must be considered as essentially one of those marked creations by which nature often adapts her works to the particular wants



A MORGAN HORSE.

one among us, inasmuch as the stock is alike remarkable for the persistency with which its good qualities are transmitted, and the strength, vigor, and durability of its species, in application to the stern and stubborn work required of them in the common business of the country.

It must not be supposed from the preceding remarks that the improvement of the horse in those forms specially adapted to the uses of the country, nor indeed in its highest forms as judged by the English standard, is a matter of indifference to our people on the contrary, there is an active, intelligent, and pervading spirit of competition and emulation among our gentlemen of ample means and liberal tastes, as well as those governed by merely utilitarian views, which is efficiently exercised in promoting the improvement of our breeds of horses. No better evidence of this need be offered than the fact that at a "General Horse Convention," held at Springfield, Massachusetts, in September, 1858, more than fifteen thousand people were assembled, including gentlemen of the highest distinction, and from every part of the United States, some of them having traveled more than two thousand miles to be present on the occasion.*

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of a climate, at the same time counteracting the tendency to the degradation of species which everywhere besets animal life.

This valuable and interesting animal died at the age of twenty-nine, having been long used as a stock-horse. It has been well said of him, that probably "no horse of this or any other country has so strikingly impressed upon his descendants, to the fifth and sixth generations, his own striking and valuable characteristics, and it may be safely asserted that the stock of no horse ever bred in this country has proved so generally and largely profitable to the breeders of it. The raising of it has made the fortunes of hundreds of individuals, and added hundreds of thousands, if not millions of dollars, to the wealth of Vermont and New Hampshire."

The fame of this breed is not confined to the United States; the present Emperor Napoleon has recently caused four of them to be taken to France for his own use.

* The Springfield "Horse Show" commenced October 10, 1853, and has since been continued annually; a field of sixty acres, called Hampden Park, has been purchased for the exhibition, and was inaugurated in 1857, the *Reverend Henry Ward Beecher making the address on the occasion.* This year (1858) we are told that "on Wednesday, September 15th, trials of speed between some of the most celebrated horses in the country took place, and attracted even still larger throngs than on the previous day. No less than twelve thousand visitors entered the grounds, and the

It may be farther stated that the use of the horse is extremely common in this country, almost every family—even those of mechanics out of the cities—possessing at least one of them. Almost every body is bred to the use of the horse,* even the women being accustomed to drive them in the light buggies and wagons so universal in our country towns. Unfortunately, the practice of horseback-riding, once so common among us, and always so cheering and healthful, especially to those whose pursuits impose sedentary habits, has fallen into disrepute. Most kinds of mere exercise are wearisome after long repetition—jading to the body and oppressive to the spirit; but, on the contrary, scampering over the hills and valleys on the back of a horse, though repeated day after day and year after year, is always refreshing to the body and cheering to the spirit.

"With a glancing eye and a curving mane,
My horse champs the bit on the bridle rein;
One spring and his saddled back I press,
And ours is a common happiness.
* * * * * * * *
There is life in the breeze as we hasten on;
With each bound some care of earth is gone,
And the languid pulse begins to play,
And the night of my soul is turned to day!
A richer verdure the earth o'erspreads,
Sparkles the streamlet more bright in the meads,
And its voice to the flowers that bend above
Is soft as the whisper of early love.
* * * * * * * *
Bound freely, my steed, for you bound not in vain,
Since thy master is now himself again;
And thine be the praise, when the leech's power
Is idle, to conquer the darkened hour—
By the might of thy sounding hoof to win
Beauty without and a joy within;
Beauty, else to my eyes unseen,
And joy, that then had a stranger been."

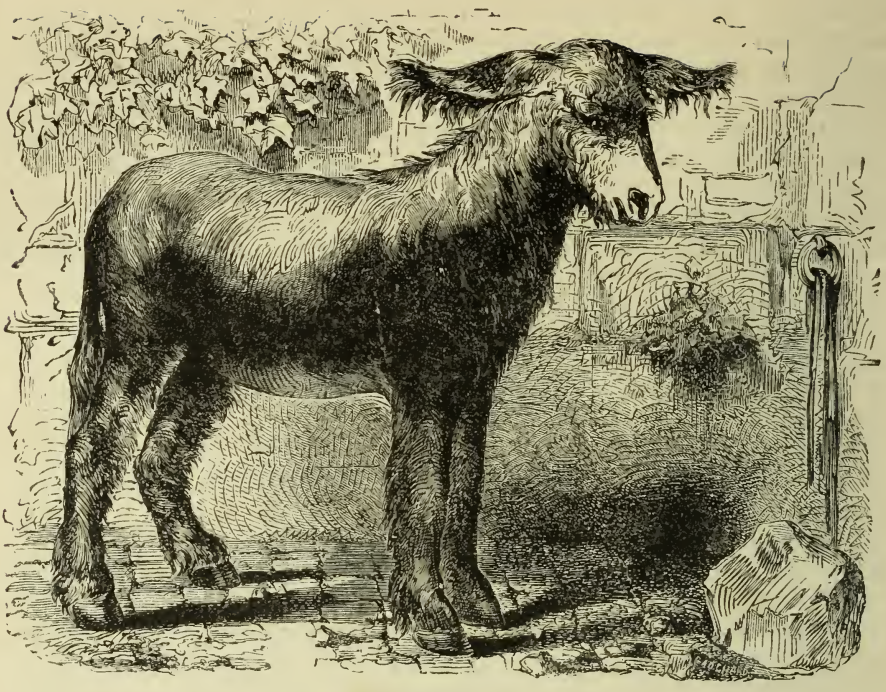
The Domestic Ass, *E. Asinus*.—This animal, which we regard as a species under the genus *Horse*, is treated by some naturalists as the type of the genus *Ass*, of which the *Onager*, *Hemione*, *Quagga*, *Dauw*, and *Zebra* are species. All these are certainly closely allied to the ass and also to the horse, some of them more particularly resembling the first and others the last; but they seem to us only to constitute so many species of the genus of which both the horse and ass are the prominent representatives. It is very certain that all these will breed together, but it is believed that all crosses between them are hybrids, and unprolific beyond one or two generations.

The same attempts have been made to find the original stock of the ass in some wild breed, as have been made in respect to the horse and other domestic animals, and with the same want of success. It is true that there are animals called *Wild Asses* in Abyssinia, and also in the deserts of Western Asia, from Tartary southward to Syria and Persia, but the probability is that these

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receipts for entrance-tickets summed up the respectable amount of five thousand dollars. Among the distinguished invited guests were Governor Banks, of Massachusetts; Governor King and staff, of New York; Governor Buckingham, of Connecticut; Governor Bissell, of Illinois, and Governor Haile, of New Hampshire; General Wool and staff, and several representatives of the Southern States. Beside these, Mayor Davis, of Worcester; Count de Sartiges, the French Minister at Washington; Commodore Vanderbilt, N. P. Willis, Father Taylor, the sailor preacher, of Boston, the Rev. Mr. Stone, and other Boston clergymen, were present. The most exciting of the races which took place on Wednesday was one between the famous trotters Ethan Allen and Hiram Drew, in which the former was victor, accomplishing the mile heat in two minutes and forty seconds." It appears that the occasion was signalized by some very extraordinary horse-taming performances by Mr. Rarey, brother of the celebrated person of that name who is noticed below, and by eloquent addresses from Edward Everett, Governor Banks of Massachusetts, Governor Buckingham of Connecticut, and others.

* An American by the name of *Rarey* has lately acquired great reputation in England for subduing vicious horses, and hence has acquired the title of the American Horse Tamer. His performances are undoubtedly very remarkable, but although several works have been published professing to give his method of proceeding, it seems that this is really a secret, kept by himself and those he has instructed in his art. It appears that in England, among the high-bred and high-fed horses—the owners of which are generally little skilled in training them—vicious animals are extremely common, more so than in this country, where every farmer is accustomed to the training of horses, and where the breeds are usually of a more docile temper. Hence Mr. Rarey has excited an interest in England which he failed to elicit in the United States, where he first exercised his profession.



THE DOMESTIC ASS.

are of two or three kinds, a part of them onagers, which are a distinct though clearly allied species, and a part the offspring of domestic animals escaped to the wilderness, and a part mules bred between these and the onager.

But leaving this subject as one upon which different authors may safely disagree, we proceed to describe the most docile, humble, and patient of the servants of man, the *Common Ass*. In its anatomy and physiology this is nearly the same as the horse. Its color varies, but is commonly gray, with a dark longitudinal band on the back, crossed on the shoulders by a similar band. Sometimes the limbs are obscurely zebraed, especially in the young. It is as diversified in size as the horse, some being found in India, Barbary, and Southern Europe no larger than a Newfoundland dog, while others are nearly of the size of the horse. They are also of many breeds, some being valued for their speed and gracefulness of form, and others only noted for their frugality, patience, and endurance. In general, they are regarded as humble drudges, slow, stupid, and given up to the lowest uses of the poor. Buffon appreciates their character more justly in the following passages:

"The ass is, then, an ass, and not a horse degenerated; the ass has a naked tail; he is neither a stranger, an intruder, nor a bastard; he has, like all other animals, his family, his species, and his rank; his blood is pure; and although his nobility is less illustrious, yet it is equally good, equally ancient with that of the horse. Why then have we so much contempt for this animal: so good, so patient, so steady, so useful? Do men carry their contempt even to animals, those which serve them so well, and at so small an expense? We bestow education on the horse, take care of him, instruct him, and exercise him, while the ass is abandoned to the care of the lowest servant, or the tricks of children; so that, instead of improving, he must lose by his education: indeed, if he had not a fund of good qualities he would certainly lose all that is valuable by the manner in which he is treated. He is the make-game of the rustics, who beat him with staffs, overload him, and make him work beyond his strength. We do not consider that the ass would be in himself and with respect to us, the most beautiful, the best formed, and most distinguished of animals if there were no horse in the world; he is the second, instead of being the first, and it is from that only that he appears to be of no value; the comparison degrades him; we look at him, and give

our opinions not from himself, but comparatively with the horse; we forget that he is an ass, that he has all the good qualities of his nature, all the gifts attached to his species, and at the same time we only think of the figure and qualities of the horse, which are wanting in him, and which he ought not to have.

"He is naturally as humble, patient, and quiet, as the horse is proud, ardent, and impetuous; he suffers with constancy, and perhaps with courage, chastisement and blows; he is moderate both as to the quantity and quality of his food; he is contented with the hardest and most disagreeable herbs, which the horse and other animals will leave with disdain; he is very delicate with respect to his water, for he will drink none but the clearest, and from rivulets which he is acquainted with; he drinks as moderately as he eats, and does not put his nose in the water—through fear, as some say, of the shadow of his ears. As care is not taken to curry him, he frequently rolls himself on the grass, thistles, and in the dust, and, without regarding his load, he lays himself down to roll about as often as he can, and by this seems to reproach his master for the little care he takes of him; for he does not paddle about in the mud and in the water; he even fears to wet his feet, and will turn out of his road to avoid the mud; his legs are also drier and cleaner than the horse; he is susceptible of education, and some have been sufficiently disciplined to become public shows."

It may be added that the ass is almost never sick; its milk is light, and is recommended in various diseases; hence it is common in Paris, Madrid, Naples, and other European cities, to see a number of these creatures driven every morning to the door of sick persons, there to be milked for their use. The skin of the ass is hard and elastic, and is used for making drum-heads, parchment, and shagreen. It attains its full growth in four or five years, and lives to the age of about five-and-twenty.



THE WHITE ASS.

It would appear, from various evidence, that the ass was domesticated at an earlier period than the horse, and at a still later date, when the horse was introduced and used almost exclusively for war in chariots, the ass was the beast of civil life, and used alike for the saddle and for carrying burdens. In the East it is treated with care and attention, and there its appearance is very different from that of the serviceable but neglected and undervalued beast of Western Europe. According to Chardin, the asses of Arabia are among the finest in the world; their coat is smooth and clean; they carry their head elevated, and have fine, well-formed legs, which they throw out gracefully in walking or galloping. These are used only for the saddle, and are imported in great numbers into Persia, where they are frequently sold for a hundred dollars, and being taught a kind of easy, ambling pace, are handsomely caparisoned, and used only by the rich and luxurious nobles. It is common to slit their nostrils, under the idea of giving them more room for breathing, as is

practiced in some countries in respect to the horse. White asses are not uncommon, and appear anciently to have been selected for the use of persons of distinction. In Syria there are three or four distinct breeds of asses, of which the most valued is that of Arabia. Some are very large, and are used for carrying persons in sedan-chairs.

Domesticated as the ass has been from the remotest antiquity, and valued as it has ever been in Western Asia, it was long before it was introduced into Western Europe. Aristotle states that in his time there were no asses in Pontus, Scythia, or in the country of the Celts—modern Germany and France;—and we know that even as late as the time of Queen Elizabeth the ass was extremely rare in England. At the present time it is common in France, Spain, Italy and Greece, especially in the large cities. It is astonishing to see the enormous burdens of fruits and vegetables which these creatures carry to market. Often a man and his wife, with two paniers—one on each side, laden with manure, or greens, or beets, or potatoes, or perhaps all of these—may be seen trudging up hill and down from the house to the farm. The ass or *donkey*—in these countries usually a very small beast—is the poor man's cart, coach, wheelbarrow, chaise, and buggy: it takes the family to church, the wife and daughters to the wedding, the baby to the christening, the cabbages, carrots, beets, turnips, potatoes, to the market. The ass does all this and keeps himself; for he needs little care, and will feed on dry leaves, stalks, thistles, briers, chaff, and straw. The ass, with the goat, is a kind of gentle and gracious providence, which makes poverty tolerable to millions of the inhabitants of Europe and Asia. In the United States it is little used, except at the south; in Mexico it is more common.*

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* The following memoranda respecting the Ass of Mexico, furnished by E. E. Dunbar, Esq., to the author, will be found exceedingly interesting:

"It is in Mexico that the '*Burros*,' as they are called—Jack, male, and Jenny, female—form a part of the household. They are the common porters from settlement to settlement, to the field, to the mill. They bring the wood and the water. They carry the produce to market, transport merchandise, food, and sometimes a part of the family, immense distances over arid deserts and stupendous mountain paths, never faltering, never tiring, where life of man or beast can be supported. Look at the long, bony frame, stout legs, tapering to a small, neat foot, the long ears, uncouth-shaped head, and shaggy coat. All go to make up the beast we call *stupid*, for 'stupid as an ass' is one of the most common sayings in the English language. But there is no greater libel on any animal that walks than this. Rather say 'knowing as an ass,' or as they have it in the Spanish language, '*El sabes mucho*'—He is very knowing.' It is true this beast is of a patient disposition, and fitted by nature to do drudgery and heavy work, but if a keen appreciation of all that renders animal life happy and comfortable, and a manifestation of the highest order of cunning and indomitable perseverance in gratifying these propensities is *stupidity*, then is the ass stupid.

"Witness the pretty '*Burrito*,' of shaggy coat and dainty feet, as he is reared in the very domicil of the Mexican laborer. Soon as his little frame can bear a few pounds' weight, the pack is on his back, and he is made to pay. For its cheapness, no pleasanter or more amusing exhibition of domestic felicity can be seen than his donkeyship, standing demure and contented, with his head just inside a Mexican shanty, and half a dozen dark-skinned, half-shirtless urchins hanging on his ears, mounting him from before and behind, tumbling off one side, crawling under his belly, between his legs, and scrambling up the other side. He usually stands at the door at the right time to secure such odds and ends as may be thrown to him from the scanty meals of the occupants. When satisfied nothing more is to be obtained in this quarter, he walks off quietly to the common or suburbs to finish his meal by browsing; and he generally manages to be out of the way when wanted. Hunting up the burros forms no inconsiderable part of the duty of Mexican youth. The said animal is usually found in some sly corner where grass and shrubs grow greenest and tenderest.

"When found, the finder mounts well on the rear, and with a moderate-sized baton, with which to guide the truant by gentle taps on the side of the head, brings him ambling to the point where duty calls.

"They are the most inveterate thieves in existence, and Dickens's 'Artful Dodger' might take lessons of them to advantage.

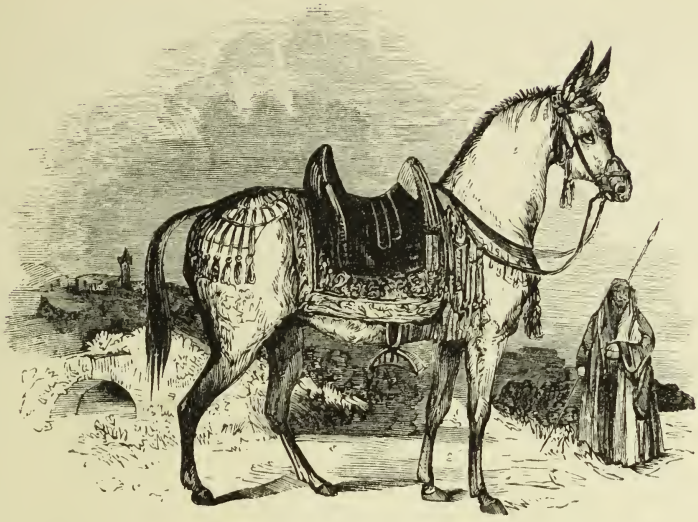
"Enter a Mexican puebla and take notice of half a dozen burros, apparently idling away their time on the shady side of a street, and looking demure and innocent, as though butter would not melt in their mouths. These artful dodgers make periodical excursions in the neighborhood, and good-bye to every thing in the shape of food in house or camp that is left unguarded. In high fruit season, especially in melon time, they manage—when not on duty—to occupy a position commanding a view of the avenues leading to the melon-shops, and if they see a stranger, or any one who looks as though he had sufficient change in his pocket to buy a melon, they take up their unconcerned, noiseless line of march to the door, and the hot sun scarcely kisses the juicy rinds thrown out ere they are appropriated.

"The most useful and remarkable qualities of these animals are their great strength and power of endurance. The writer has known a train of donkeys to carry burdens of three hundred weight each, more than three-quarters their own weight, over a desert ninety miles in extent, without water, the thermometer ranging one hundred and ten degrees during the day, and the trip occupying three days.

"They have no means of defense from beasts of prey but their heels. They sometimes escape by their speed, which is great only when frightened, and sometimes they contend successfully by kicks, which are hard, incessant, and



THE DONKEY RACE.



THE ABYSSINIAN MULE.

The MULE,* *Equus Asinus*—variety *Mulus*—is the hybrid produce of an ass with a mare, having a clumsy head, long, erect ears, a short mane, and a thin tail. The HINNY, *E. Asinus* or *Hinnus*, is the hybrid of a she-ass with a stallion. Of this the head is long and thin, the ears like those of a horse, the mane short, the tail well-filled with hair. It is less hardy and useful and is not often bred. The mule is greatly valued in some countries for the saddle and for drawing vehicles. They are of various breeds and of various sizes; those bred from Spanish mares are sometimes fifteen and sixteen hands high, and sell for one hundred and fifty to two hundred

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quick as flashes of light. The Jacks wage a fearful warfare with stallions, generally coming off victorious by obtaining a bull-dog hold of the windpipe, and never relinquishing their grasp until the noble animal falls fatally bitten or strangled to death.

"The donkey has neither the obstinacy nor malice of the mule, but is rather of a kind and gentle disposition. His laziness and artful tricks are what sometimes render him vexatious.

"But considering his patience, gentle disposition, strength, power of endurance, and regarding him as the father of mules, the *donkey* or *ass* deserves to rank high among useful animals."

* The term *Mule*, which properly signifies the hybrid offspring of an ass and mare, is applied to other hybrids, so that we even say a *mule* Canary bird. Under this head, therefore, Gervais furnishes us with the following curious list of hybrids that have been produced between some of the more prominent classes of quadrupeds:

HYBRIDS AMONG THE EQUIDÆ.—The *ass* with the *mare* produces the variety, *mule;* the French call the male offspring *mulet* and the female *mule*. They apply the term *bardeau* to the offspring of the horse with the female ass.

The *ass* has bred with the *female zebra* at Knowsley, in Lord Derby's menagerie.

The *zebra* has bred with the *female ass* at the Garden of Plants, Paris.

The *ass* has bred with the *onager* both at Knowsley and the Garden of Plants.

The *male onager* has bred with the *dauw* at Knowsley.

HYBRIDS AMONG THE BOVIDÆ.—The *common bull* and *cow* have bred with the *American bison*.

The *bull* has bred with the *zebu* and with the *yak*, and the *yak* with the *zebu*.

The *zebu* has bred with the *jungle cow;* Gray considers the offspring to be the *gagal*.

HYBRIDS AMONG SHEEP AND GOATS.—The *domestic sheep* has bred with the *mouflon* of Corsica, and the *ibex* or *bouquetin* has bred with the *domestic goat*. Several other instances of mixture between domestic sheep and goats and the allied wild species are known.

HYBRIDS AMONG DEER.—The *pseudaxis* has bred with the *axis*, and the *cervus gymnotus* has bred with the *C. Virginianus*.

HYBRIDS AMONG DOGS.—The *wolf* has bred with the *domestic dog;* also with the *dingo* of New Holland; the *dog* has bred with the *jackal*.

HYBRIDS AMONG THE CAT FAMILY.—The *lion* has bred with the *tigress* in a menagerie at London.

HYBRIDS AMONG THE RODENTIA.—The *porcupine* has bred with the *Javan acanthion* at the menagerie of the Zoological Society of London.

HYBRIDS AMONG MONKEYS.—The *common macake* has bred with the *rhesus macake* and the *crowned macake;* the *grivet* has bred with the *common macake*.

Various hybrids among different species of domestic animals, as *hogs*, *lamas*, *camels*, &c., are also known.



QUEEN ISABELLA OF SPAIN MOUNTED ON A MULE.

dollars. They will travel for months together, carrying from seven to eight hundred weight on their backs. Mules are much used in Spain, Portugal, Italy, and the East, and also in South America and Mexico; many also are employed in the Southern States on the plantations, and some of them have lately been applied to the omnibus-cars in the city of New York.

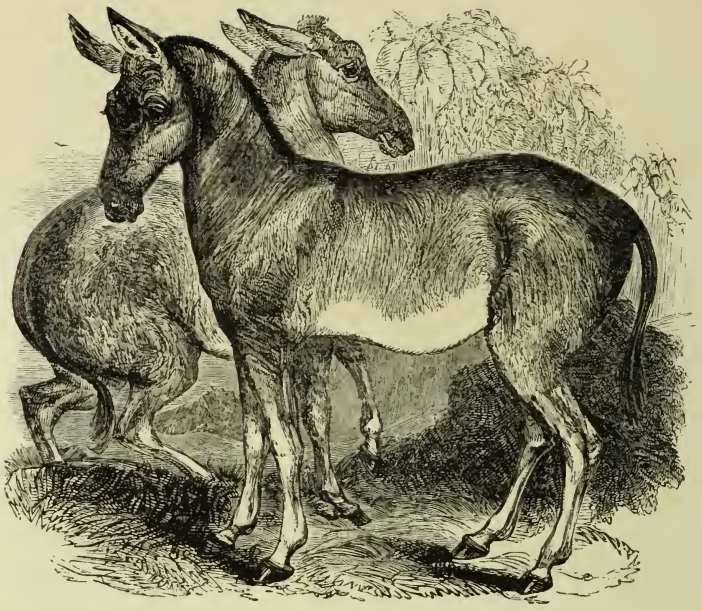
The mule is in fact an exceedingly hardy, strong, and useful animal. In all mountain countries, from its sureness of foot, its instinctive caution in choosing the path, and its skillful management in descending a perilous and steep track, it is eminently serviceable. Among the Andes, in South America, it has nearly superseded the lama. In Spain, which is a mountainous country, with few good roads, it is extensively used for carriages, and also for the transportation of merchandise. His rider, the *muleteer*, has become the general medium of traffic through the interior, and has long been recognized as forming a curious and peculiar type of national manners. "He lives frugally and hardily; his alforjas of coarse cloth hold his scanty stock of provisions; a leathern bottle, hanging at his saddle-bow, contains wine or water for a supply across barren mountains and thirsty plains. A mule-cloth spread upon the ground is his bed at night, and his pack-saddle is his pillow. His low but clean-limbed and sinewy form betokens strength; his complexion is dark and sunburnt; his eye resolute but quiet in its expression, except when kindled by sudden emotion; his demeanor is frank, manly, and courteous, and he never passes you without a grave salutation—'*Dios guarde á usted! Va usted con Dios, caballero!*' 'God guard you! God be with you, cavalier!'" Very elegant breeds of the mule have been used for the saddle in Spain for centuries; some of these animals are so docile and graceful that fair dames, including even royalty itself, have preferred them to the gentle palfry and the sprightly genet.



THE ZEBRA AT THE GARDEN OF PLANTS, PARIS.

The Onager or Koulan, *Asinus sylvestris*—the *Equus Onager* of Brisson and Pallas, and *Asinus Onager* of Gray—is the *Khur* or *Gour* of the Persians; the *Hamar* of Mesopotamia, and the *Wild Ass* of Kutch; it is indeed generally denominated the *Wild Ass*, but it is doubtful if it be so in fact. It was described by Xenophon and Pliny under the name of *Onager*. Its color in summer is pale reddish; in winter grayish; the dorsal streak, which is common to this and several of the allied species, is black, and rather wider over the small of the back; the skull is high up and far back. It has a general resemblance to the ass, and is found on the plains of Mesopotamia, Persia, Kutch, the shores of the Indus, and the Punjaub. It is said also to exist in large numbers on the high steppes between the Caspian and Aral Seas, and many of them are taken thence to Orenburg. It lives in troops, the old ones being very shy and difficult of approach, even within reach of the rifle; the young are frequently caught alive. In general, these animals are left in their wild state, being regarded by the natives of the countries they inhabit as untamable; but at Bombay they are used both for the saddle and for draught, and there is no reason to doubt that they might be generally domesticated and rendered useful. Since 1842 several of them, of both sexes, have been in the Garden of Plants at Paris, and have successfully produced and reared young ones. Specimens have also been in the menageries of London and Knowsley, the animals being erroneously called *Hemiones*.

The Hemione or Kiang, *E. Hemionus*—the *E. Polyodon* of Hodgson; the *Wild Ass* of Tartary—is the *Hemione*, that is, *Demi-Ass* of Xenophon; the *Jikta* of Shaw; *Dgiggitai* of Cuvier, and *Dzigethai* of Buffon. In this the fur is short, smooth, and bright-red bay; the legs are straw-color; there is a broad, longitudinal dorsal streak, broadest over the small of the back, without any cross-band on the shoulders. In winter the hair becomes long and woolly, and of a pale



HEMIONE.

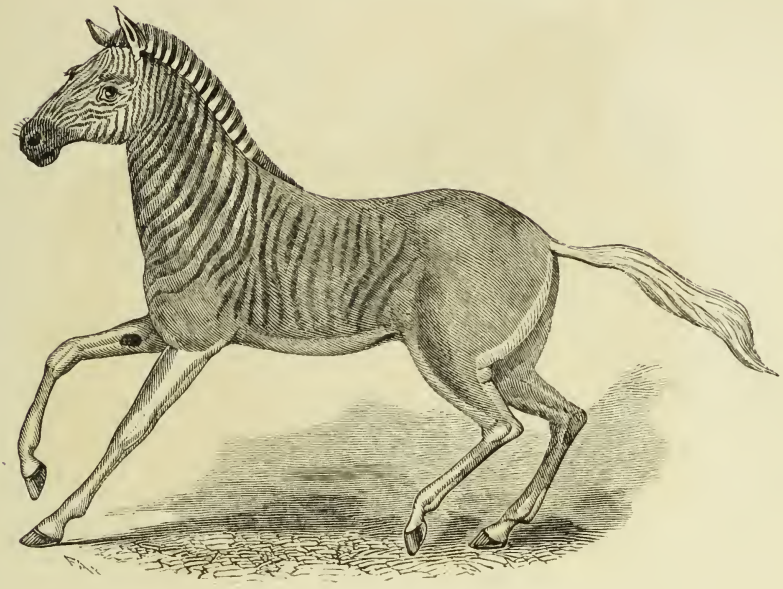
color; this is thrown off in summer. The skull is low down in the center of the space between the face-line and the base of the teeth. These animals are found in Thibet, living in bands of from eight to ten females under the care of a single male, sometimes on the plains and sometimes on the mountains, where the thermometer is often below zero.

This species has been confounded with the onager, but Dr. Walker observes—"The Kiang neighs like a horse; the wild ass of Kutch brays like an ass; the Kiang has no zebra stripes, neither in the adult nor in the foal; in the wild ass of Kutch transverse zebra stripes are seen on the shoulder of the adult, and still more on that of the foal; sometimes also the shoulder-cross has been seen. The habitat of the Kiang is on the high table-land of Thibet; of the wild ass of Kutch in the sultry plains near the mouth of the Indus." It may be added that the Kiang is much the largest, the stallions standing fourteen hands high. When taken young these animals become tame, so as to be led about like horses.

The Yo-to-tze, the *Asinus equuleus* of H. Smith, of which a living specimen was lately exhibited in Park Lane, London, is regarded by Dr. Gray as either a kiang or a mule between the kiang and domestic ass.

The Quagga, *E. Quagga*—the *Asinus Quagga* of Gray—sometimes called the *Cape Horse* and also the *Isabella Ass*, has more resemblance to the horse than the ass in its form; its general color is brown, the head, neck, and withers striped or zebraed with blackish-brown; the lower part of the body, the legs and tail, white. Its voice is said to resemble the bark of a dog, and to express the word *quagga*, whence its name. It is a native of the plains of Southern Africa; sometimes it approaches the settlements and mingles with the domestic animals. It is capable of domestication, and is occasionally employed for draught and burden. It is courageous, and defends itself with spirit from ferocious beasts, especially the hyenas, which often attack it. Many of them are, however, devoured by lions. Cummings and other adventurers in Southern Africa speak of frequently meeting troops of these animals, which it seems are killed for their flesh, it being much relished by the natives.

The Dauw, or Peechi, or Peet-see, sometimes called Burchell's Zebra, the *E. Dauw* or *Asinus Burchellii*, is of a pale brown color, the under side of the body being whitish; head, body, and upper part of the legs black streaked; tail, inside and lower part of the legs white. This species is a tenant of the plains, and is found occurring in every district north of the Orange River, as far



THE QUAGGA.

as travelers have penetrated. It dwells in troops, which make occasional migrations from the interior to the more fertile districts in search of food. At irregular and uncertain intervals there occur seasons of drought in South Africa, when the pools of the desert are dried up, and the surface of the wilderness is parched. Driven from their native solitudes by the desolation around them, dauws, quaggas, antilopes, and other animals in incredible multitudes, pour like a torrent over the cultivated districts, destroying the pasturage and the corn; with the return of the rain they retrace their steps and seek their desert fastnesses.

The Dauw is strong and muscular, with sinewy limbs, and might perhaps be made serviceable to man. It is an animal that admits of being tamed to a certain extent with facility, and occasionally a half-domesticated specimen is exposed for sale at Cape Town with a rider on its back. The persons, however, who have had most opportunities of becoming acquainted with its character, regard it, tractable as it may sometimes appear, as treacherous and fickle, vicious and obstinate. It is a remarkable fact that this species, and the quagga also, are often seen in company with the ostrich, several of the latter feeding tranquilly in the midst of a herd without experiencing any molestation. This species may be distinguished from its mountain relative, the zebra, which it resembles, by the shortness of its ears, by the absence of stripes on the limbs and under surface of the body, and by the stripes of the upper parts being brown. They are said to present an exceedingly brilliant appearance when flying in troops before the hunter. Their flesh, with that of the zebra and quagga, is relished by the natives, but Mr. Burchell thought it not much superior to horse-flesh, and he would, with most Europeans, think the same respecting the flesh of the wild ass, which in Persia is in the highest estimation, and is served at royal banquets.

This and the preceding species are common in the menageries of Europe. Of the specimens of the dauw in the Garden of Plants, at Paris, M. Is. Geoffroy says, "We have seldom put them in harness, but we have bred them to the third generation; after the second the acclimation is complete; I have seen one of our French dauws lying tranquilly upon the snow at sixteen degrees centigrade below zero."

The Zebra, *E. zebra* of Linnæus, *Asinus Zebra* of Gray—the *Hippotigris* of Dion Cassius—sometimes called the *Wild Paard* by the Dutch colonists, is generally esteemed not only the most beautiful of the equine family, but one of the most beautiful of quadrupeds, on account of the markings of its skin. The ground color is white, or yellowish-white, but the head, body, and



THE DAUW.

legs to the hoofs are regularly striped, mostly crosswise, with deep brown-black bands, lighter in the middle. From this form of marking we have the word *zebraed*, significant of a regular banding of the skin of an animal. The ears of the zebra are long, the neck short and deep, with a sort of dewlap under the throat, produced by a loose fold of the skin; the mane is short, and the tail sparsely clad with long hair. The form resembles that of the ass, but the size nearly equals that of the horse.

Wild and swift, this species lives in troops in the bold ranges of craggy mountains remote from the abodes of man. Its disposition is savage and intractable, and it is by no means easily obtained, not only from its fleetness, but from the nature of the localities it frequents, where, like the wild ass of Thibet, in "the wilderness and the barren land is his dwelling; he scorneth the multitude of the city." Nevertheless, zebras have been taken to Europe and placed in the menageries. All attempts to domesticate them, or to train them to the service of man, have failed; about a century ago, however, the King of Portugal had four of them, which he sometimes drove harnessed to his carriage.

Fossil Equidæ.—The remains of extinct Equidæ have been found in the deposits of the pliocene period, in Europe, in India, and even in North and South America, where the horse did not exist at the time of the discovery of Columbus. These races in North America appear to have flourished and perished with the Mastodon; in South America with the Megatherium. Whether any of the animals to whom these bones belonged were similar to any existing species has not been determined; several species, however, are supposed to be made out, and have received appropriate titles, as *Equus fossilis*, *E. plicidens*, *E. Asinus fossilis*, *E. curvidens*, &c.



ZEBRAS.



THE ASIATIC ELEPHANT.

ORDER 11. **PACHYDERMATA.**

The animals of this order, containing the largest that live upon the land, are characterized by the thickness of their tough and leathery skin and the want of a ruminating stomach, though their natural food is wholly vegetable. Most of them are but thinly clothed with hair, and some are almost entirely destitute of it, having only a few scattered bristles. The impenetrable character of the hide is thus needful to protect them from the maddening punctures of the venomous ticks and flies which swarm in the sultry regions of the tropics. For the same reason they seek refuge, during the burning heat of the day, in ponds and rivers, where, immersed to the neck,

they enjoy the refreshing coolness, or, wallowing in the soft mud of the morasses, acquire an additional protection against these, their most formidable, though tiny foes. Conscious of their own massive strength, they feared no other enemies until the aggressions of man taught them his superiority; inoffensive and peaceful, they rarely use their gigantic powers of injury; but when irritated, they often exhibit a furious and revengeful ferocity. Heavy and massive in their structure, their pillar-like limbs seem ill-calculated for speed; yet, "their pace, when they have fairly commenced it, from the length of their stride, and the great propelling weight of their bodies, is for a time very rapid, and bears before it all ordinary obstacles, clearing a way through the thickest and most matted underwood."

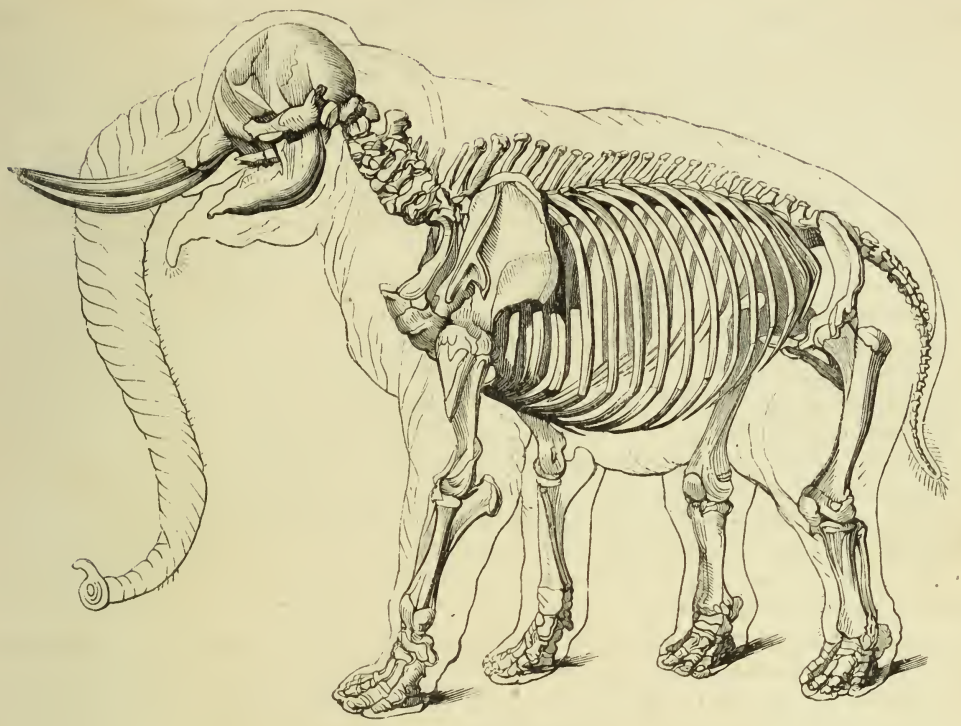
In many of the species the canine or incisor teeth are developed into curved tusks, which in some attain a monstrous size. The nose also is greatly lengthened, sometimes into a broad, flexible muzzle, and sometimes into a long snout or trunk. The Elephants are the best examples of both these peculiarities of structure. It is probable that this order contains the longest lived of all the land animals; Mr. Hodgson informs us that the Indian Rhinoceros is believed to live for a hundred years, and that one, taken mature, was kept at Katmandoo for thirty-five years without exhibiting any symptoms of approaching decline. It is the common opinion in India that the Elephant sometimes lives three centuries; this is improbable, though several now in the service of the East India Company were old when they came into possession of the Europeans, upward of ninety years ago. Most of the species, especially those of gigantic size, inhabit the continent and great islands of Asia and the continent of Africa. Some, however, are peculiar to America, and others have a very extensive range.

The various species are divided into six families, as follows: the *Elephantidæ*, *Rhinoceridæ*, *Hippopotami*, *Tapiridæ*, *Suedæ*, and *Hyracidæ*.

THE ELEPHANTIDÆ OR PROBOSCIDÆ.

Of this family there is a single genus, ELEPHANT, *Elephas*, the species of which are the largest of living quadrupeds. They are distinguished by having five toes to each foot, very complete in the skeleton, but so enveloped by the callous skin which surrounds the foot that their only external appearance consists in the nails attached to the extremity of this species of hoof. They have no canines nor incisors, properly speaking; but in the incisive or intermaxillary bones are implanted two defensive tusks, which project from the mouth, and frequently attain enormous dimensions. The magnitude of the sockets necessary to hold these tusks renders the upper jaw so high, and so shortens the bones of the nose, that the nostrils in the skeleton are placed near the top of the face; but in the living animal they are prolonged into a cylindrical trunk, composed of more than forty thousand small muscles variously interlaced, flexible in all directions, endowed with exquisite sensibility, and terminated by an appendage like a finger. This trunk imparts to the elephant as much address as the perfection of the hand does to the monkey. It enables him to seize whatever he wishes to convey to his mouth, and to suck up the water he is to drink, which, by the flexure of this admirable organ, is then poured into the throat, thus supplying the want of a long neck, which could not have supported so large a head with its heavy tusks. The trunk also is the organ of the voice, and through it the animal utters strong, trumpet-like tones. Within the parietes of the cranium are several great cavities, which render the head lighter; the lower jaw has no incisors whatever; the intestines are very voluminous; the stomach simple; cœcum enormous; the mammæ, two in number, placed under the chest. The young suck with the mouth and not with the trunk, as was asserted by Buffon. The period of gestation is twenty months; the young at birth are three feet high; they are able immediately to follow their mother. There are only two species.

The Asiatic Elephant, *E. Indicus*, differs from the African species, not only in its greater size and in the characters of the teeth and skull, but also in the comparative smallness of the ears, the paler brown color of the skin, and in having four nails on the hind-feet instead of three. The sagacity of this species is also supposed to be greater than that of the African elephant. But though many wonderful stories are told, and some of them are as true as they are wonderful, of



SKELETON OF AN ELEPHANT.

the grateful remembrance which it long retains of benefits conferred, or of the tenacity with which it "treasures up a wrong," and though the instances of its docility, both ancient and modern, are very extraordinary, we agree upon the whole with Cuvier, who says that after having studied these animals a long time, he never found their intelligence to surpass that of a dog or of many other carnivorous animals. It is imposing to see such a mountain of vitality obedient to the voice of its keeper, and performing feats at his dictation; and the massive gravity of its physiognomy assists the impression.

These huge animals live in considerable troops, seeking moist situations, where the vegetation is abundant and vigorous. They feed on large succulent plants, and as the quantity they devour is enormous, they are frequently obliged to change their places to obtain supplies. They are fond of the sugar-cane, and sometimes do immense damage in the plantations. The herds are usually led by an old male, who seems to exercise general influence over them. They are fond of marshes, and traverse rivers, being excellent swimmers. Excessive heat and cold are alike unfavorable to them. They have a rapid trot, and it requires a fast horse to follow them when at their greatest speed. In running, they keep flapping their large ears as if they were wings. In their flight they turn with difficulty, and are very slow and clumsy in descending rapid declivities. The general color of this species is an earthy-gray; the skin, which is tough and hard, is nearly naked, having only a few short hairs scattered here and there. Some of these animals are albinos, and are white, tinged with rose-color. Some of the natives along the Ganges believe these to be held in regard by the spirits of the ancient kings. The kings of Siam, Pegu, and other countries of Farther India, add to their titles, "Lord of the White Elephant!" They keep these animals in their palaces, causing them to be sumptuously harnessed and served by a large number of domestics.

The size of this species varies from seven to ten feet high, eight feet being the average; the length of the body from the mouth to the insertion of the tail is ten to fifteen feet. They attain their full size at about twenty-four years of age; the average of life is about seventy-five years, though instances of much greater age are common. They are seldom bred in captivity; nearly

all those which are used are taken from their native haunts and then trained. The modes of capturing them are various: sometimes a large number of the Indian hunters combine and contrive to drive the herd into a strong inclosure, where they are separately subdued. Sometimes the hunters proceed into the woods, accompanied by two trained females. When a herd is met with, these advance quietly, and by their blandishments so occupy the attention of any unfortunate male they come up with, that the hunters are enabled to tie his legs together and fasten him to a tree. His treacherous companions now leave him to struggle in impotent rage, until he is so subdued by hunger and fatigue that the hunters can drive him home between their two tame elephants. Sometimes, however, these hunting adventures are more exciting. The following account is descriptive of an attempt to catch elephants in Nepaul:

"The whole batch, tame and wild ones, then rushed into a deep river close by, where it was a splendid sight to see them swimming, fighting, diving, plunging, kicking, and bellowing in a most frantic manner; the *mahouts*—the riders on the tame ones—sticking to them like monkeys, and dexterously taking the opportunity of the confusion to secure the dreaded noose round their necks. One of the wild elephants in the struggle got half drowned, and then entirely strangled; she just staggered to the shore, and then dropped dead without a struggle. It was really quite piteous to see her poor little young one, about ten days old; she kept walking round the body, pushing it, and trying to coax her dead mother to rise up, then uttering the most heart-rending cries, and lying down by her side, as it were to comfort her.

"When the contest was over, and the other elephants—tame ones—were brought up near the corpse, the poor little thing, with the most indignant, though of course, unavailing valor, charged on all sides at any elephant who came near, determined, evidently, to defend its mother, even though dead, to the last. The tame ones of course were too sagacious to hurt it with their tusks, and looked on with the most curious air of pity and contempt, as they gradually, despite its violent struggles, pushed it away from its mother to a place where it could be properly secured and taken care of. Really its moans and endeavors to remain with its mother were quite affecting."

There are several castes or varieties of the elephant, as the *Koomareah*, meaning, of a princely race; the *Merghee*, a hunting elephant; the male *Dauntelah* is noted for its large tusks; the *Mooknah* have much smaller ones; the *Goodnah* are particularly large males, seldom captured, and when taken, ferocious and destructive. Some of these cannot brook confinement, and languish and die in captivity. There is almost as much difference in the domestic elephants, as to gait, docility, strength, and serviceableness, as in horses.

The tusks of both species—the African as well as the Asiatic—still form, as they did from the earliest periods, a valuable article of commerce. The ivory, which is now sought for useful purposes and ornaments of minor importance, such as knife-handles, billiard-balls, chess-men, combs, &c., was in great request with the ancient Greeks and Romans for various domestic uses, as well as for the chrys-elephantine statuary rendered so famous by Phidias. Of these rich statues the Minerva of the Parthenon, and especially the Olympian Jupiter, appear to have been the masterpieces. Among the tusks found there are some which indicate the rough usage these animals have received from the hands of man. Sometimes a musket-ball has been found imbedded in one without any aperture or mark to show how it got there. In these cases, the ball has penetrated the root of the tusk, and been pushed forward by successive growths of ivory as the tusk increased in size. A spear-head has been found in the same position. It is said that forty-five thousand elephant-tusks are brought every year to Sheffield, in England, at a cost of one hundred and thirty thousand dollars. Five hundred persons are there occupied as ivory workers!

The elephant occupies the greater part of the warm countries of Asia, and the great islands of Sumatra and Borneo. Those of the provinces of Chittagong are chiefly used in the service of the East India Company, but those of the Birman territories and of Pegu are of a superior breed. These animals are abundant in the southern part of Nepaul. Those found in Ceylon, having a lighter and smaller head and higher fore-quarters than others, are supposed by Hodgson to be distinct species; at all events they are a marked variety.

From time immemorial the Asiatic Elephant has been brought under the dominion of man,



AN EAST INDIAN MONARCH, MOUNTED ON AN ELEPHANT.

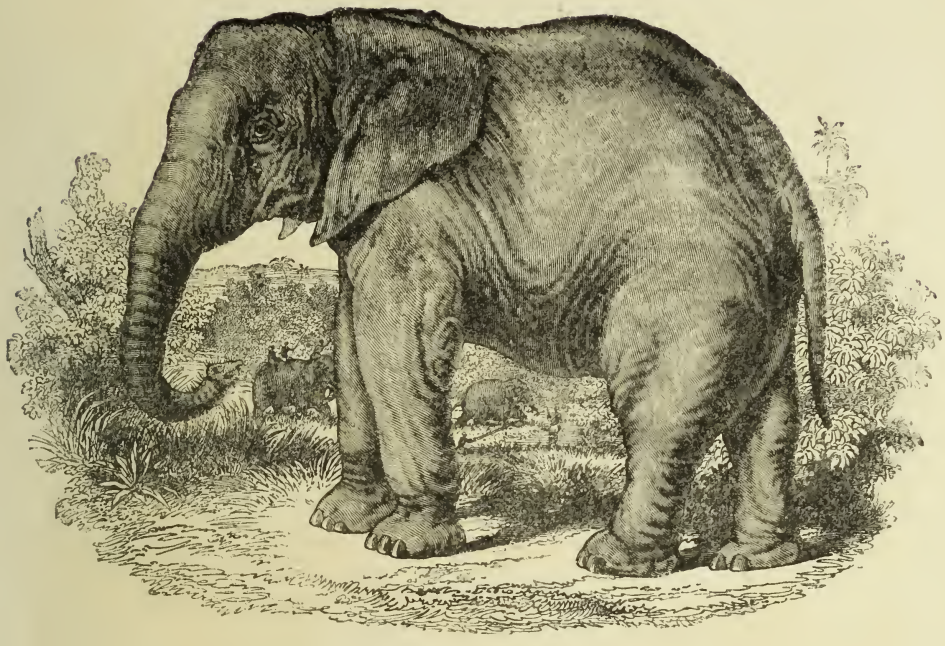
and has long been trained to swell the pomp of pageants, and add to the terrors of war, as well as to perform the useful offices of a beast of burden and draught, and the dreadful one of executing the sentence of death on criminals. It has been made the companion of the sports of the Orientalist in the great hunting parties, and from an early period has been made to minister to the wanton and cruel pleasures of Eastern princes, by being stimulated to combat not only with other elephants but with various wild animals. It is curious that the elephant is not mentioned in the Bible, though ivory is spoken of in the commerce carried on by Hiram and Solomon. From about 270 B. C. they were known at Rome, and were introduced into the triumphal processions. In 122 B. C. they were used in the war against the Allobroges, in Gaul. Alexander took a large number in his victories over the Indian King Porus. Hannibal marched into Italy with numbers of these animals, and the tusks found imbedded in the soil along the banks of the Arno, and now shown in the museum at Florence, are popularly considered to have belonged to those which perished in the passage across the territory, which was then a deep, tangled morass, though more probably they are the remains of proboscidiens of remote geological ages. The Ptolemies of Egypt, as well as the Seleucides of Syria, had numerous war-elephants. Haroun-al-Raschid, among the presents dispatched to Charlemagne, sent an elephant, which was embarked at Pisa A. D. 801, and was conveyed to Aix la Chapelle.

In more modern times the Asiatic Elephant has become common in the menageries of Europe and America, and is always the great attraction alike of the wise and the simple, the philosopher and the child. Its performances in a tank or reservoir of water appropriated to its use—now rolling and wallowing in it like a huge puncheon; now squirting the water into the air from the trunk as from the pipe of a fire-engine, and now sinking to the bottom, the whole enormous mass becoming invisible, the top of the trunk only being above water so that the animal may breathe, as is done by a man in a diving-bell—are all exceedingly curious and wonderful. The use of the trunk in receiving presents of cake, fruit, straw, or hay, and then thrusting them into the mouth, and also in picking up small substances, even pieces of money, from the floor, and all this being done with a facility, neatness, and dexterity equal to that of the human hand, excites just and endless admiration. The look of the monster all this time—blending a curious gravity of the hill-like head with the shrewdness of intelligent, inquisitive little eyes—excites a strange, wondering curiosity, perhaps even a kind of sympathy, sometimes amounting to fascination. In India the elephant is a familiar beast; in ancient times it went to war with towers filled with soldiers on its back; it now carries traveling parties in a similar manner. Kings and princes ride upon it in



ELEPHANT OF THE GARDEN OF PLANTS, PARIS.

state, and the animal seems to take a grave delight in the pomp and pageantry of which it forms a part. Many of these creatures are employed in carrying burdens, one of them being able to support a weight of three or four thousand pounds; it will bear a thousand pounds on its tusks. It loads and unloads boats with its trunk; it pulls at a tackle; it rolls and lifts and carries barrels and hogsheads; in short, it does the work of oxen, horses, and men. In India the elephant is thus a useful as well as familiar beast; but the inhabitants of that country do not look upon it with the strange, ruminating wonder which it always excites among our people.



THE AFRICAN ELEPHANT.

The African Elephant, *E. Africanus*, as we have said, according to various authorities, is somewhat smaller than the Asiatic;* the head is rounded, the front convex instead of concave, and the nails on each hind-foot are three instead of four. It lives in large herds in Central and Southern Africa, where it is constantly hunted by the natives and also by Europeans, who venture into these regions to pursue the various wild beasts which abound there. Its flesh is relished by the inhabitants of many districts in Africa. Major Denham speaks of it as being greatly esteemed by the people, and he adds that, though it looked coarse, it was better flavored than any beef he found in the country. The ancient Romans considered the trunk as the most delicious part; but Levaillant speaks of the foot as a dish for a king, and more recent travelers bestow on it equal praise. The disposition of this species is supposed to be more ferocious than that of the Asiatic Elephant, though its habits in a state of nature do not greatly differ. It is not now tamed, but the Carthaginians, as well before as after the time of Hannibal, availed themselves of the services of this species as the Indians did of those of the Asiatic Elephant. The elephants used by the Ptolemies of Egypt were of this species, as well as those exhibited in the Roman arena by Cæsar and Pompey, and from this kind principally, if not entirely, the ivory for ornamental purposes and the statues before alluded to, seems to have been taken.

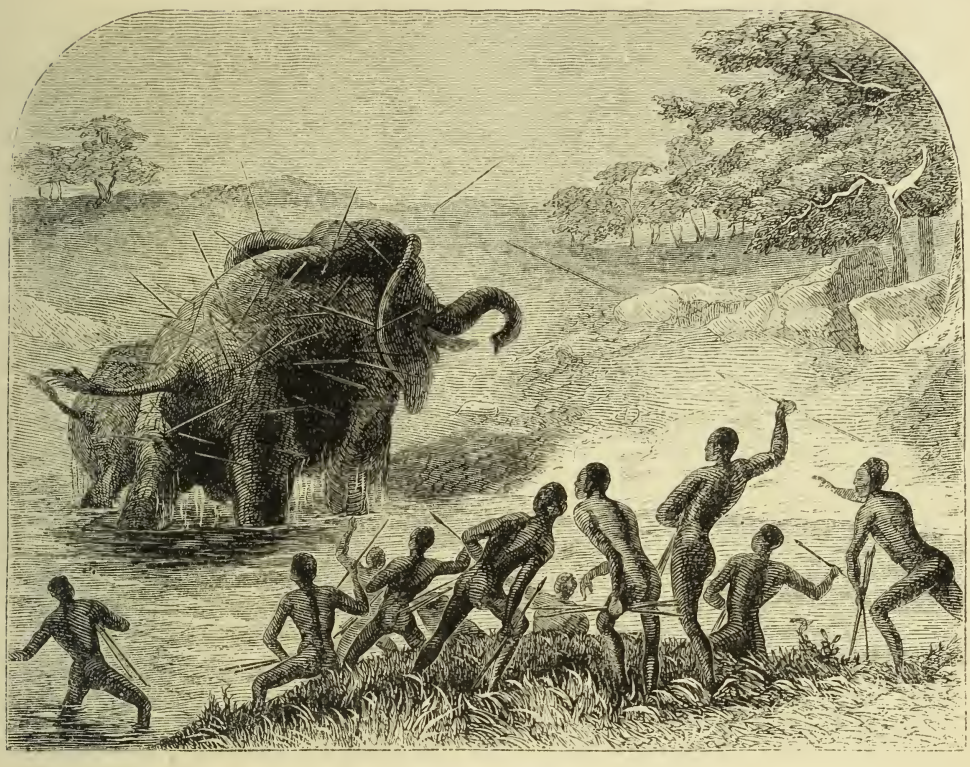
The following excellent description of the elephant of Africa is furnished by Cummings. This animal, he says, "is widely diffused through the vast forests, and is met with in herds of various numbers. The male is much larger than the female, consequently much more difficult to kill. He is provided with two enormous tusks. These are long, tapering, and beautifully arched; their length averages from six to eight feet, and they weigh from sixty to a hundred pounds each. In the vicinity of the equator the elephants attain to a greater size than to the southward, and I am in the possession of a pair of tusks of the African bull elephant, the larger of which measures ten feet nine inches in length, and weighs one hundred and seventy-three pounds. The females, unlike Asiatic elephants in this respect, are likewise provided with tusks. The price which the largest ivory fetches in the English market is from £28 to £32 per hundred and twelve pounds. Old bull elephants are found singly or in pairs, or consorting together in small herds, varying from

* On this point there is some contradiction: Mr. Case, who is an excellent authority, puts the average of the Asiatic Elephant at nine feet high; Dr. Livingstone says the African Elephant averages nine or ten feet in height.

six to twenty individuals. The younger bulls remain for many years in the company of their mothers, and these are met together in large herds of from twenty to a hundred individuals. The food of the elephant consists of the branches, leaves, and roots of trees, and also of a variety of bulbs, of the situation of which he is advised by his exquisite sense of smell. To obtain these he turns up the ground with his tusks, and whole acres may be seen thus plowed up. Elephants consume an immense quantity of food, and pass the greater part of the day and night in feeding. Like the whale in the ocean, the elephant on land is acquainted with, and roams over, wide and extensive tracts. He is extremely particular in always frequenting the freshest and most verdant districts of the forest, and when one district is parched and barren, he will forsake it for years, and wander to great distances in quest of better pasture.

"The elephant entertains an extraordinary horror of man, and a child can put a hundred of them to flight by passing at a quarter of a mile to windward, and when thus disturbed they go a long way before they halt. It is surprising how soon these sagacious animals are aware of the presence of a hunter in their domains. When one troop has been attacked, all the other elephants frequenting the district are aware of the fact within two or three days, when they all forsake it, and migrate to distant parts, leaving the hunter no alternative but to inspan his wagons and remove to fresh ground. This constitutes one of the greatest difficulties which a skillful elephant-hunter encounters. Even in the most remote parts, which may be reckoned the headquarters of the elephant, it is only occasionally, and with inconceivable toil and hardship, that the eye of the hunter is cheered by the sight of one. Owing to habits peculiar to himself, the elephant is more inaccessible, and much more rarely seen, than any other game quadruped, excepting certain rare antilopes. They choose for their resort the most lonely and secluded depths of the forest, generally at a very great distance from the rivers and fountains at which they drink. In dry and warm weather they visit these waters nightly, but in cool and cloudy weather they drink only once every third or fourth day. About sundown the elephant leaves his distant midday haunt, and commences his march toward the fountain, which is probably from twelve to twenty miles distant. This he generally reaches between the hours of nine and midnight, when, having slaked his thirst and cooled his body by spouting large volumes of water over his back with his trunk, he resumes the path to his forest solitudes. Having reached a secluded spot, I have remarked that full-grown bulls lie down on their broadsides, about the hour of midnight, and sleep for a few hours. The spot which they usually select is an ant-hill, and they lie around it with their backs resting against it; these hills, formed by the white ants, are from thirty to forty feet in diameter at their base. The mark of the under tusk is always deeply imprinted in the ground, proving that they lie upon their sides. I never remarked that females had thus lain down, and it is only in the more secluded districts that the bulls adopt this practice; for I observed that in districts where the elephants were liable to frequent disturbance, they took repose standing on their legs beneath some shady tree. Having slept, they then proceed to feed extensively. Spreading out from one another, and proceeding in a zigzag course, they smash and destroy all the finest trees in the forest which happen to lie in their course. The number of goodly trees which a herd of bull elephants will thus destroy is utterly incredible. They are extremely capricious, and on coming to a group of five or six trees they break down not unfrequently the whole of them, when, having perhaps only tasted one or two small branches, they pass on and continue their wanton work of destruction. I have repeatedly ridden through forests where the trees thus broken lay so thick across one another that it was almost impossible to ride through the district, and it is in situations such as these that attacking the elephant is attended with most danger. During the night they will feed in open plains and thinly-wooded districts, but as day dawns they retire to the densest covers within reach, which nine times in ten are composed of the impracticable wait-a-bit thorns, and here they remain drawn up in a compact herd during the heat of the day. In remote districts, however, and in cool weather, I have known herds to continue pasturing throughout the whole day.

"The appearance of the wild elephant is inconceivably majestic and imposing. His gigantic height and colossal bulk, so greatly surpassing all other quadrupeds, combined with his sagacious disposition and peculiar habits, impart to him an interest in the eyes of the hunter which no other



ELEPHANT ATTACKED BY THE NEGROES WITH JAVELINS.

animal can call forth. The pace of the elephant, when undisturbed, is a bold, free, sweeping step, and from the peculiar spongy formation of his foot, his tread is extremely light and inaudible, and all his movements are attended with a peculiar gentleness and grace. This, however, only applies to the elephant when roaming undisturbed in his jungle; for, when roused by the hunter, he proves the most dangerous enemy, and far more difficult to conquer than any other beast of the chase."

Other accounts of the elephants in Africa, furnished us by recent hunters and travelers, are exceedingly curious and interesting. From these it appears that this animal is pursued with much eagerness by the natives of South Africa, and the chase is usually a scene of great excitement and interest. Seeking him in the green valleys or umbrageous retreats in which he loves to dwell, they hesitate not to attack him on foot, armed only with their native spears or javelins and a large knife. Taking advantage of his inability to see behind him, and his unwieldiness in turning, they often manage to creep up and hamstring him before he is made aware of their approach, and then they cast showers of javelins into him until he becomes mortally wounded and falls, the signal for a general shout of triumph from the whole party. Livingstone witnessed an instance of this kind, which he describes as follows: "The goodly beast, totally unconscious of the approach of an enemy, stood for some time suckling her young one, which seemed about two years old; they then went into a pit containing mud, and smeared themselves all over with it, the little one frisking about his dam, flapping his ears and tossing his trunk incessantly, in elephantine fashion. She kept flapping her ears and wagging her tail, as if in the height of enjoyment. Then began the piping of her enemies, the negro hunters, which was performed by blowing into a tube, or the hands closed together, as boys do into a key. They call out to attract the animal's attention—

'O chief! chief! we have come to kill you,
O chief! chief! many more will die beside you,
The gods have said it,' etc., etc.



HUNTING ELEPHANTS IN AFRICA.

Both animals expanded their ears and listened, then left their bath as the crowd rushed toward them. The little one ran forward toward the end of the valley, but seeing the men there returned to his dam. She placed herself on the danger side of her calf, and passed her proboscis over it again and again, as if to assure it of safety. She frequently looked back to the men, who kept up an incessant shouting, singing, and piping; then looked at her young one and ran after it, sometimes sideways, as if her feelings were divided between anxiety to protect her offspring and desire to revenge the temerity of her persecutors. The men kept about a hundred yards in her rear, and some that distance from her flanks, and continued thus until she was obliged to cross a rivulet. The time spent in descending and getting up the opposite bank allowed of their coming up to the edge, and discharging their spears at about twenty yards' distance. After the first discharge she appeared with her sides red with blood, and, beginning to flee for her own life, seemed to think no more of her young. It ran very fast, but neither young nor old entered into a gallop; their quickest pace was only a sharp walk. The calf took refuge in the water and was killed. The pace of the dam gradually became slower. She turned with a shriek of rage and made a furious charge back among the men. They vanished at right angles to her course, or sideways, and, as she ran straight on, she went through the whole party, but came near no one except a man who wore a piece of cloth on his shoulders. Bright clothing is always dangerous in these cases. She charged three or four times, and, except in the first instance, never went farther than a hundred yards. She often stood after she had crossed a rivulet, and faced the men, though she received fresh spears. It was by this process of spearing and loss of blood that she was killed; for at last, making a short charge, she staggered round and sank down dead in a kneeling posture."

The following extract from Pringle's "Wanderings in South Africa" furnishes a clear idea of the habits of these animals in a wild state: "After mid-day, we came upon the recent traces of a troop of elephants. Their huge foot-prints were everywhere visible, and in the swampy spots, on the banks of the river, it was evident that some of them had been luxuriously enjoying themselves, by rolling their unwieldy bulks in the ooze and mud. But it was in the groves and jungles that they had left the most striking proofs of their recent presence and peculiar habits. In many places paths had been trodden through the midst of dense thorny forests, otherwise impenetrable.

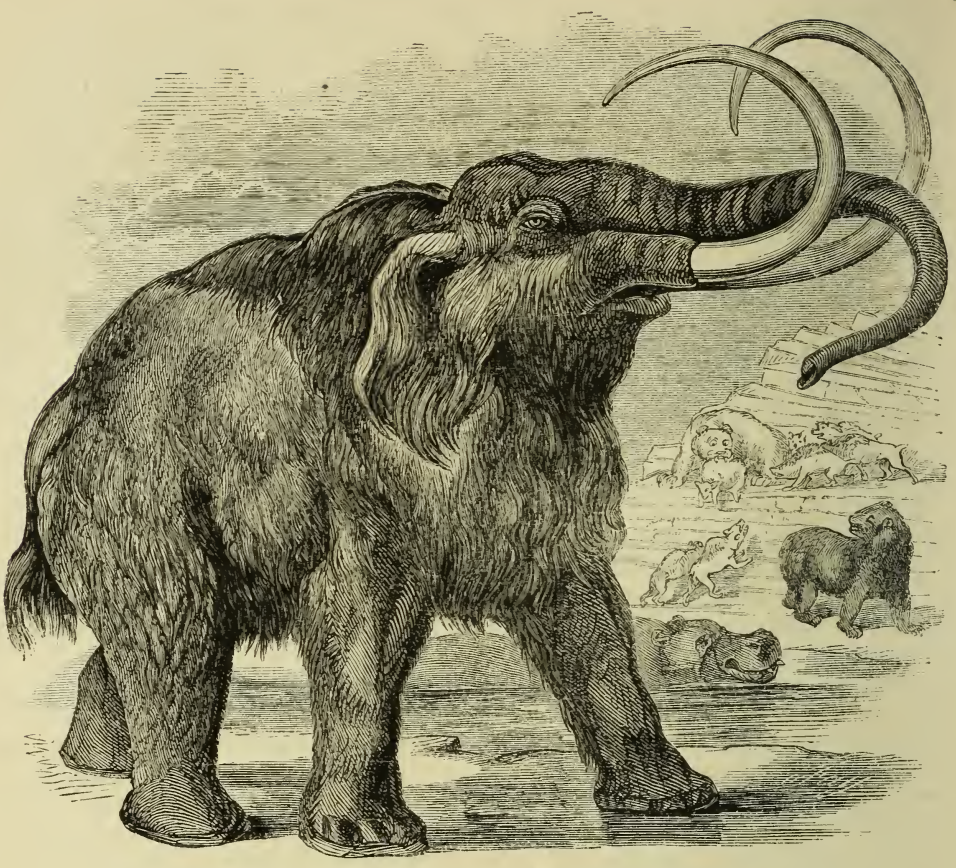
They appeared to have opened up these paths with great judgment, always taking the best and shortest cut to the next open savannah, or ford of the river, and in this way their labors were of the greatest use to us by pioneering our route through a most intricate country, never yet traversed by a wheel carriage, and great part of it, indeed, not easily accessible, even on horseback. In such places the great bull elephant always marches in the van, bursting through the jungle as a bullock would through a field of hops, treading down the brushwood, and breaking off with his proboscis the larger branches that obstruct the passage, while the females and younger part of the herd follow in his wake.

"Among the mimosa-trees sprinkled over the meadows, or lower bottoms, the traces of their operations were not less apparent. Immense numbers of these trees had been torn out of the ground and placed in an inverted position, in order to enable the animals to browse at their ease on the juicy roots, which form a favorite part of their food. I observed that in numerous instances, when the trees were of considerable size, the elephant had employed one of his tusks exactly as we would use a crowbar, thrusting it under the roots to loosen their hold of the earth, before he attempted to tear them up with his proboscis. Many of the larger mimosas had resisted all their efforts; and indeed, it is only after heavy rains, when the soil is soft and loose, that they can successfully attempt this operation."

Captain Harris gives us the following affecting incident, which took place the day after a successful hunt: "Not an elephant was to be seen on the ground that was yesterday teeming with them, but on reaching the glen which had been the scene of our exploits, a calf, about three and a half feet high, walked forth from a bush, and saluted us with its mournful, piping notes. We had observed the unhappy little wretch hovering about its mother after she fell, and, having probably been unable to overtake the herd, it had passed a dreary night in the wood. Entwining its little proboscis about our legs, the sagacious creature, after demonstrating its delight in our arrival by a thousand ungainly antics, accompanied the party to the body of its dam, which, swollen to an enormous size, was surrounded by an inquest of vultures. The conduct of the quaint little calf now became quite affecting, and elicited the sympathy of every one. It ran round its mother's corse with touching demonstrations of grief, piping sorrowfully, and vainly attempting to raise her with its tiny trunk. At length, the miniature elephant, finding that its mother heeded not its caresses, voluntarily followed our party to the wagons, where it was received with shouts of welcome from the people, and a band of all sorts of melody from the cattle. It died, however, in spite of every care, in the course of a few days, as did two others, much older, that we subsequently captured."

We have already alluded to the murderous slaughter of elephants in Africa by other hunters, and especially by Cummings. All these seem to have been surpassed, however, by a Frenchman named Delegorgue, who, with two negro attendants, met a herd consisting of eleven of these animals and killed every one of them. They fell so piled on one another as to constitute a strange, grotesque heap, which, says the narrator, so excited the risible faculties of the party as momentarily to deprive them of strength. If man is the greatest of destroyers, he is also the only one that laughs over his fallen prey, unless, indeed, it may be the hyena.

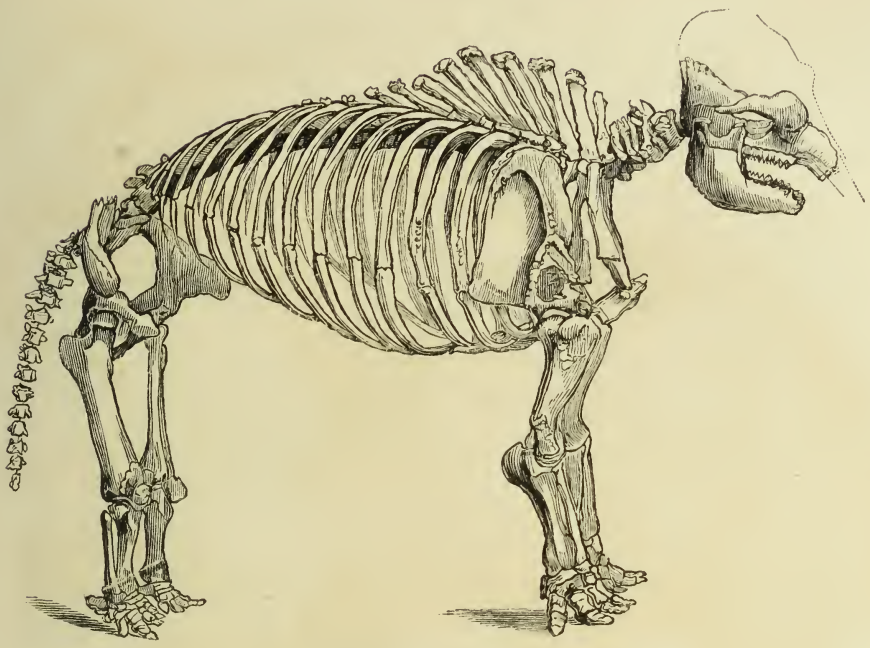
Fossil Proboscidians.—The fossil remains of several species of Proboscidiens are found, many of them in high northern latitudes, where no animals of this kind now exist. Bones and tusks of elephants or mastodons occur throughout Russia, and more particularly in Eastern Siberia and the arctic marshes. The tusks are very numerous, and in so high a state of preservation that they form an article of commerce, and are employed in the same works as what may be termed the living ivory of Asia and Africa, though the fossil trunks fetch an inferior price. Siberian fossil ivory forms the principal material on which the Russian ivory-turner works. The tusks most abound in the Laichovian Isles and on the shores of the Frozen Sea, and the best are found in the countries near the arctic circle, and in the most eastern regions, where the soil in the very short summer is thawed only at the surface; in some years not at all. In 1799 a Tungusian named Schumachoff, who generally went to hunt and fish at the peninsula of Tamut after the fishing season of the Lena was over, had constructed for his wife some cabins on the banks of the Lake Oncoul, and had embarked to seek along the coasts for tusks, called horns by the people of



FOSSIL ANIMALS RESTORED: MAMMOTH, HIPPOPOTAMUS, CAVE BEARS, TIGERS, AND HYENAS.

that region. One day he saw among the blocks of ice a shapeless mass, but did not then discover what it was. In 1800 he perceived that this object was more disengaged from the ice, and that it had two projecting parts, and toward the end of the summer of 1801 the entire side of the animal and one of his tusks were quite free from ice. The summer of 1802 was cold, but in 1803 part of the ice between the earth and the MAMMOTH, for such was the object, having melted more rapidly than the rest, the plane of its support became inclined, and the enormous mass fell by its own weight on a bank of sand. In March, 1804, Schumachoff came to his Mammoth, and having cut off the tusks, exchanged them with a merchant by the name of Adams for goods of the value of fifty rubles. For some years the flesh of this animal was cut off for dog-meat by the people around, and bears, wolves, gluttons, and foxes fed upon it till the skeleton was nearly cleared of its flesh. About three-fourths of the skin, which was of a reddish-gray color, and covered with reddish wool and black hairs eight inches long, was saved, and such was its weight that it required ten persons to remove it; the bones of the head, with the tusks, weighed four hundred and sixteen pounds. The skeleton was taken to St. Petersburg, where it may be seen still in the Museum of Natural History; twenty-six pounds of the hair, which was secured, can also be seen. The height of the skeleton is nine and a half feet and the length of the body is sixteen feet. This animal must have been twice the size of the existing elephant, and weighed at least twenty thousand pounds!

This species has received the name of *Elephas primigenius*. Bones of this and many other extinct elephantine animals, forming several species, are met with in different parts of the world; they are found associated with the huge bones of the *Hippopotamus major*, the Cave Bear, *Ursus Spelœus*, the Cave Hyena, *Canis Hyœna Spelœus*, and an enormous tiger, *Machairodus latidens*,



SKELETON OF A MASTODON.

and a multitude of other animals of various species, which have now ceased to exist. In the United States the bones of an animal resembling the mammoth, but in some respects different, have been discovered in various places, mostly in alluvial deposits, and near the salt-licks of the Western States. This species has received the name of MASTODON, *Mastodon maximus*. Several skeletons of this, more or less perfect, exist in the United States. One of the largest and most complete was found in 1845 near Newburg, Orange County, New York, and belonged to the late Dr. John Warren, of Boston. The remains of about a dozen other extinct species of Mastodon have been discovered.

THE RHINOCERIDÆ.

The animals of this family are covered with a hard, naked, rough skin, in some cases laid in large folds, seeming like huge bucklers. The head is elongated and triangular, and from the upper surface of the muzzle there springs a single or double horn, composed of a solid mass of horny fibers resembling whalebone, supported upon a broad, bony protuberance of the nose. These horns, which are powerful weapons of defense, and which are also sometimes used to tear away tangled branches and obstructions, are of considerable size, measuring frequently two feet and a half in length, and sometimes much more. They are of an elongated, conical form, and are usually more or less curved backward; but in the British Museum there are two horns which are evidently curved in the opposite direction, and probably belonged to a species of which nothing further is at present known. The same collection contains another horn, which is more slender than usual, and curved backward almost in a semicircle, which probably was a mere peculiarity of one individual. When two horns are present, they are placed one behind the other, and the hinder one is much shorter than the anterior. Only two sorts of teeth, incisors and molars, are found in the jaws, and of these the former sometimes fall out before the animal is full-grown. The canines are entirely wanting. The molars are usually seven in number on each side of each jaw; their surface exhibits projecting lunate ridges. The body is very bulky, and is supported upon short, strong legs; the feet have three toes, which are only indicated externally by the hoofs. The eyes are small; the ears small, pointed, and nearly erect; the thick and hard skin



INDIAN RHINOCEROS.

has only a few hairs, which are stiff and bristly, and mostly confined to the edges of the ears and the end of the tail.

These animals are found in the same regions of the Old World as those inhabited by the elephants; they live like them in the forests, and feed exclusively upon coarse herbage and the leafy twigs of trees and shrubs. They appear, as a general rule, to be peaceable animals, unless irritated; in this case they charge with great fury upon their enemy, holding the head down, so as to present the point of the horn toward him. They are generally hunted merely for the sake of sport, but the natives of the countries inhabited by them kill them for the flesh; walking-sticks of great beauty are cut out of their thick hides, and their horns are worked into boxes and

drinking-cups, to the latter of which the eastern nations attribute the power of indicating the presence of poison in any fluid that may be put into them. Little more than twenty years ago only four living species belonging to this family were known, but the number has since been increased to seven, and Dr. Gray has very recently described the horns of what appear to be two other species, distinct from any of those previously known.

Genus RHINOCEROS: *Rhinoceros.*—Of this, the only genus, there are several species. The most celebrated is the INDIAN RHINOCEROS, *R. unicornis* of Linnæus, *R. Indicus* of F. Cuvier. Of this the head and neck are rather short; the eye is small and lateral, and the animal cannot see in front, more particularly when the horn is full-grown, as it stands in the way of vision. The body is about nine feet long and five feet high; in its structure it is peculiarly massive, heavy, and hog-like, and often weighs six thousand pounds. It has a single horn from two to three feet long. The skin is of an earth-color, hard and thick, and often turns a musket bullet; its surface is rough and mammillated, especially on the croup and down the fore-shoulders; its folds are very distinct, and resemble plate armor. It is almost wholly destitute of hair, except at the tip of the tail and on the margins of the ears. This species inhabits Hindostan, Siam, and Cochin China; shady and marshy places in the neighborhood of rivers being its chosen haunts. It is fond of wallowing in the mire somewhat in the manner of hogs. Its food consists of grass and the branches of trees. The flesh is not unpalatable.

This powerful animal, living amid the tall, rank vegetation of the jungles of India, and especially along the marshy borders of the Ganges, the Burrampooter, and other great rivers, can only be hunted with the aid of elephants. They are usually found in small herds of four to six, led on by the most powerful among the troop. Their first instinct is to fly from such an attack, but if hard pressed they rush upon the elephants and seek to thrust the nose beneath the belly and rip them up by a fierce toss of the horn. The elephants, however, avoid this movement, and turning the back, receive the shock in that quarter, usually with little damage. Often, however, the impetus of the rhinoceros precipitates the elephant in a headlong plunge to the ground, and finding this to succeed, he will repeat the operation several times in succession. Formerly it was found that the hide of the rhinoceros was impenetrable to ordinary musket-balls; they are now easily brought down by larger and harder bullets.

The Indian Rhinoceros is that usually brought to Europe and America, and which we are familiar with in the menageries; it is also that which is best known in history. The Romans became acquainted with it toward the close of the republic, and Pompey introduced it into the circus. It also figured in the triumphal procession of Augustus with Cleopatra—the beautiful Queen of Egypt and the hoggish rhinoceros combining to swell the pomp of the victor! Representations of this animal also appear on various coins of this period, and in the palestrian mosaics of Rome. In the fanciful tales of the Arabian Nights a curious passage tells us that the rhinoceros fought with the elephant, pierced his belly with his horn, and carried him off on his head; but the fat and the blood filled his eyes and rendered him entirely blind, so that he fell prostrate on the earth. In this state of things a huge Roc came and carried them both off to his young ones in his prodigious talons. It is curious to trace the threads of truth even in the wildest popular fiction: the manner of fighting here imputed to the rhinoceros is according to nature, and as to the Roc—a bird as big as a village windmill—late discoveries have shown the bones of extinct species twelve or fourteen feet high, the traditions of which may well have been wrought into this gigantic feathered monster.

The JAVAN RHINOCEROS, *R. Javanus*, formerly confounded with the preceding, greatly resembles it, and has but one horn; it is, however, somewhat smaller, rather more hairy, has a smaller head, with a more sharpened muzzle, and the flexible lip, especially, being more attenuated. The folds are less prominent, and around the neck are nearly obliterated; the tubercles of the skin are smaller and more angular. It is called *Warak* by the Javanese and *Badak* by the Malays. It is a native of Java.

The SUMATRAN RHINOCEROS, *R. Sumatrensis*, is even somewhat smaller than the preceding; it has two horns, the first long and bent backward, the second, placed a little forward of the eyes, smooth and pyramidal. The skin is less rough than in the preceding species, and the folds less

distinctly marked. It is a native of Sumatra, and though found from the sea-coast to the mountains, seems to prefer high situations.

The African Rhinoceros or Gargatan, *R. bicornis*, is of a pale yellowish-brown; the horns, which are two, are of unequal length, and of a livid brown color, with tints of green; the few hairs on the tip of the tail and the margins of the ears are black and bristly; the folds of the skin are not so distinct as in the *R. Indicus*; the length is greater, ten to eleven, and even twelve feet. This species is known to the colonists of the Cape under the name of *Rhinaster;* it feeds on brushwood and the branches of small trees, and is found only in wooded districts. It feeds slowly, is a lazy animal, and subsists with a small amount of nourishment.

The Keitloa Rhinoceros, or Sloan's Rhinoceros, *R. Keitloa*, is of a pale brownish-yellow, with two horns nearly of equal length; length of the body and head eleven to twelve feet.

The Common White Rhinoceros, or Muchoco, or Mohoohoo, or Burchell's Rhinoceros, *R. simus*, is of a pale gray-brown, with a yellowish tinge; the edges of the ears and tip of the tail clothed with black, bristly hairs; the mouth ox-like; the horns two, the anterior one very long, the other very short; the body and head twelve feet long; the height five feet seven inches There appears to be still another species, the Kobaoba or Long-horned White Rhinoceros.

The four kinds immediately preceding are all found in Southern Africa, and all have two horns. Thus we are acquainted with seven species of rhinoceros, and there is reason to believe there are in Africa two or three others. It is in this quarter of the world that these animals appear most abundant, and here they have been of late unsparingly pursued by the hunters. Cummings furnishes the following information in respect to them:

"Of the rhinoceros there are four varieties in South Africa, distinguished by the Bechuanas by the names of the '*Borèle*,' or black rhinoceros, the '*Keitloa*,' or two-horned black rhinoceros, the '*Muchoco*,' or common white rhinoceros, and the '*Kobaoba*,' or long-horned white rhinoceros. Both varieties of the black rhinoceros are extremely fierce and dangerous, and rush headlong and unprovoked at any object which attracts their attention. They never attain much fat, and their flesh is tough, and not much esteemed by the Bechuanas. Their food consists almost entirely of the thorny branches of the wait-a-bit thorns. Their horns are much shorter than those of the other varieties, seldom exceeding eighteen inches in length. They are finely polished with constant rubbing against the trees. The skull is remarkably formed, its most striking feature being the tremendous, thick ossification in which it ends above the nostrils. It is on this mass that the horn is supported. The horns are not connected with the skull, being attached merely by the skin, and they may thus be separated from the head by means of a sharp knife. They are hard, and perfectly solid throughout, and are a fine material for various articles, such as drinking-cups, mallets for rifles, handles for turners' tools, &c., &c. The horn is capable of a very high polish. The eyes of the rhinoceros are small and sparkling, but do not readily observe the hunter, provided he keep to leeward of them. The skin is extremely thick, and only to be penetrated by bullets hardened with solder. During the day, the rhinoceros will be found lying asleep, or standing indolently in some retired part of the forest, or under the base of the mountains, sheltered from the power of the sun by some friendly grove of umbrella-topped mimosas. In the evening they commence their nightly ramble, and wander over a great extent of country. They usually visit the fountains between the hours of nine and twelve o'clock at night, and it is on these occasions that they may be most successfully hunted, and with the least danger. The black rhinoceros is subject to paroxysms of unprovoked fury, often plowing up the ground for several yards with its horn, and assaulting large bushes in the most violent manner. On these bushes they work for hours with their horns, at the same time snorting and blowing loudly; nor do they leave them in general until they have broken them into pieces. All the four varieties delight to roll and wallow in mud, with which their rugged hides are generally encrusted. Both varieties of the black rhinoceros are much smaller and more active than the white, and are so swift that a horse with a rider on its back can rarely overtake them. The two varieties of the white rhinoceros are so similar in habits that the description of one will serve for both, the principal difference consisting in the length and set of the anterior horn; that of the common white rhinoceros aver-



HUNTING THE RHINOCEROS.

aging from two to three feet in length, and pointing backward, while the horn of the long-horned white rhinoceros often exceeds four feet in length, and inclines forward from the nose. . . .

"Both these varieties of rhinoceros attain an enormous size, being the animals next in magnitude to the elephant. They feed solely on grass, carry much fat, and their flesh is excellent, being preferable to beef. They are of a much milder and more inoffensive disposition than the black rhinoceros, rarely charging their pursuer. Their speed is very inferior to that of the other varieties, and a person well mounted can overtake and shoot them." The description of the famous rhinoceros birds is very interesting:

"Before I could reach the proper distance to fire, several 'rhinoceros birds' by which he was attended warned him of his impending danger by sticking their bills into his ear, and uttering their harsh, grating cry. Thus aroused, he suddenly sprang to his feet, and crashed away through the jungle at a rapid trot, and I saw no more of him. . . . .

"These rhinoceros birds are constant attendants upon the hippopotamus and the four varieties of rhinoceros, their object being to feed upon the ticks and other parasitic insects that swarm upon these animals. They are of a grayish color, and are nearly as large as a common thrush; their voice is very similar to that of a mistletoe thrush. Many a time have these ever-watchful birds disappointed me in my stalk, and tempted me to invoke an anathema upon their devoted heads. They are the best friends the rhinoceros has, and rarely fail to awaken him, even in his soundest nap. 'Chukuroo' perfectly understands their warning, and, springing to his feet, he generally first looks about him in every direction, after which he invariably makes off."

Fossil Rhinoceridæ.—The remains of several fossil species of rhinoceros, distinct from the existing ones, have been found in Europe and Asia, but none in America or Australia. The following have been recorded: *R. tichorinus*, Cuv.; *R. incisivus*, Cuv.; *R. leptorhinus*, Cuv.; *R. minutus*, Cuv.; *R. elatus*, Croiz. and Job.; *R. pachyrhinus*, Cuv.; *R. hypselorhinus*, Kaup.; *R. Goldfusii*, Kaup.; *R. leptodon*, Kaup. The first and third of these species are British.



HIPPOPOTAMUS.

THE HIPPOPOTAMIDÆ.

Of this family there is a single genus, HIPPOPOTAMUS, *hippopotamus*, and a single species, the Amphibious Hippopotamus, *H. amphibius*. Of this the muzzle is exceedingly thick and blunt, the head is very large, but the greater part of its bulk is made up of the facial bones, which are of enormous size when compared with the cranium. The lower jaw is of immense size and power. Both jaws are armed with teeth of three different sorts, and some of these attain a large size. The incisors are four in each jaw; they are of a cylindrical pointed form, the two middle

ones are much longer than the others, and those of the lower jaw project forward considerably. The canines are very large in the lower jaw; they are always worn away at the point by rubbing against one another. The molars are six or seven in number on each side, both above and below; they are of a quadrangular form, and exhibit at first numerous triangular tubercles, which, when worn down, leave peculiar isolated spots of enamel on the surface of the teeth. The whole form and structure of this creature is heavy and unwieldy, even among the Pachydermata; it is covered with a very thick naked skin, which only bears a few bristles upon the lips and at the tip of the very short tail. The general color is a leaden brown; the skin habitually secretes drops of cinnamon-colored sweat. The legs are short and stout, and the feet have four toes, each terminated by a hoof. The eyes and ears are small.

The hippopotamus is exclusively an inhabitant of Africa, in many of the rivers of which continent it is tolerably abundant. It is a large animal, the males, according to some travelers, attaining a length of fourteen or fifteen feet. It feeds entirely upon vegetable substances, cropping the herbage and bushes on the banks of the rivers, and occasionally visiting the cultivated grounds during the night, when it does great damage. It passes most of its time in the water, where it swims and dives with great ease, and is said even to walk at the bottom. When the head of the animal is below the water it rises frequently to blow it out from its nostrils, making it ascend in two jets. On shore, it trots heavily, but with considerable rapidity, and when two of them meet on solid ground they frequently fight ferociously, rearing up on their hind-feet, and biting one another with great fury, so that, according to African travelers, it is rare to find a hippopotamus which has not some of his teeth broken, or the scars of wounds upon his body. When not irritated they appear to be quiet and inoffensive; but a very trifling irritation is sufficient to rouse their anger, when they attack the offender most furiously with their teeth; a hippopotamus which had been touched accidentally by a boat has turned upon it and torn out several of the planks, so that it was with difficulty the crew got to shore. A hippopotamus has also been known to kill some cattle which were tied up near his haunts, apparently without the slightest provocation.

The flesh of this unwieldy animal is said to be very good, and not unlike pork; it is in high esteem with the inhabitants of South Africa, both native and European. The feet, the tongue, and the tail are the favorite parts, and a thick layer of fat which covers the ribs is held in great esteem when salted and dried. It is called *Zeekoe-zpeck*; the name given to the hippopotamus by the Dutch colonists being *Zeekoe*, or Sea-cow. The skin is cut into whips, which are highly prized, and the large canine teeth are sometimes used instead of ivory. Specimens of the hippopotamus have been in the London Zoological Gardens and the Garden of Plants at Paris, and in other collections.

In Harris's Sports of South Africa we have the following accurate account of the habits of the hippopotamus: "This animal abounds in the Limpopo, dividing the empire with its amphibious neighbor the crocodile. Throughout the night the unwieldy monsters might be heard snorting and blowing during their aquatic gambols, and we not unfrequently detected them in the act of sallying from their reed-grown coverts, to graze by the serene light of the moon; never, however, venturing to any distance from the river, the stronghold to which they betake themselves on the smallest alarm. Occasionally, during the day, they were to be seen basking on the shore, amid ooze and mud; but shots were most constantly to be had at their uncouth heads, when protruded from the water to draw breath; and, if killed, the body rose to the surface. Vulnerable only behind the ear, however, or the eye, which is placed in a prominence, so as to resemble the garret window of a Dutch house, they require the perfection of rifle practice, and after a few shots become exceedingly shy, exhibiting the snout only, and as instantly withdrawing it. The flesh is delicious, resembling pork in flavor, and abounding in fat, which in the colony is deservedly esteemed the greatest of delicacies. The hide is upward of an inch and a half in thickness, and being scarcely flexible, may be dragged from the ribs in strips like the planks from a ship's side."

Cumming says that the track of the hippopotamus may be distinguished from any other animal by a line of unbroken herbage which is left between the marks of the feet of each side, as the

width of the space between the right and left legs causes the animal to place its feet so considerably apart as to make a distinct double track. This enterprising hunter had various adventures with these huge animals. In one instance, as he tells us, he wounded a sea-cow in a river, whereupon he rushed into the water, seized her by the tail, and cut a slit in the hide, upon the rump. Holding on to this, he forced her to the bank. He then ran a rope through the slit, and moored her fast to a tree, and then dispatched her.

It may be remarked that the hippopotamus, as well indeed as the elephant and rhinoceros, is fast disappearing in all the countries where it exists, before the incessant and destructive war made upon it by fire-arms. It could resist, and for ages did resist, the rude and ineffective weapons of savages and barbarians, living and multiplying in spite of them; but the species must soon yield to the destructive propensity and power of civilized men.

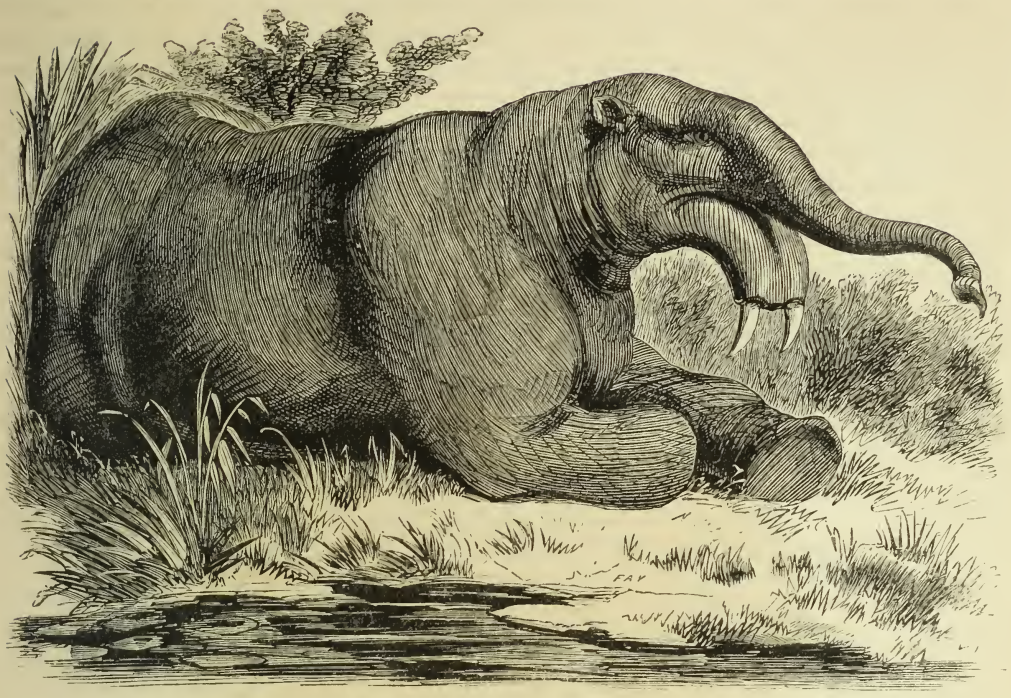


THE TAPIR.

THE TAPIRIDÆ.

In this family the nose is produced into a short proboscis, and the skin is covered with hair. The skull is of a pyramidal form, somewhat like that of a pig; but the nasal bones are much arched, to give support to the muscles of the proboscis. The jaws are fully furnished with teeth; there are six incisors and two small canines in each jaw; the upper jaw has seven and the lower six molars on each side. The ears are small, upright, and of much the same form as in the pig; the neck is high, and furnished with a sort of stiff mane; the skin is clothed with short close hair; the tail is very short; and the fore-feet are furnished with four and the hinder with three toes, all distinctly separated, and terminated by nail-like hoofs. In their form these animals resemble both the horse and the ass; and thence are called by the natives *wild mules*, and sometimes *sea-horses*. They live in the moist tropical forests, generally sleeping during the day in the thickets, and wandering forth chiefly at night to feed on grass and other vegetable substances. They are also fond of the water, and swim well.

Genus TAPIR: *tapirus*.—Of this, the only genus, there are several species. The best known is the Common American Tapir, *T. Americanus*, which occurs in all parts of South America, from the Isthmus of Panama almost to the southern extremity of that continent. It is a large animal, measuring six feet in length, and is of a uniform brown color. It inhabits the forests, always in the neighborhood of water, in which it delights to bathe, frequently rolling in the mud like a pig. In districts unfrequented by man it is said to move about in the daytime; but in the neighborhood of human habitations it is more cautious, and rarely leaves its resting-place



THE DINOTHERIUM.

except at night. It frequently breaks into the cultivated grounds in large herds, when the destruction caused by their devouring the melons and other fruits, as well as by the trampling of so many heavy feet, is often very serious.

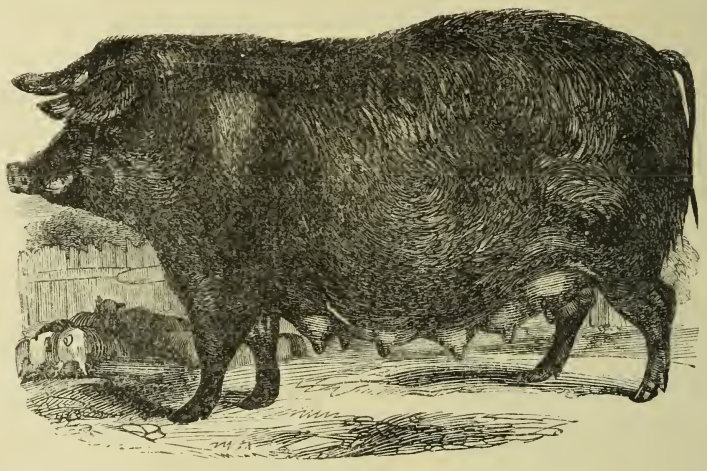
The second South American species, *T. Roulini* or *T. villosus*, is but little known; it differs from the preceding in being smaller and nearly black, and having longer hair. It is found upon the Andes of Colombia and Peru, at a considerable elevation, but sometimes mingles with the other species. It is this which has given rise to a fabulous animal called *Pinchaque*, which figures in the South American legends, as inhabiting the lofty mountain peaks of New Grenada.

The Indian Tapir, *T. Indicus* or *T. bicolor*, the *Maiba* of F. Cuvier, is larger than either of the American species, measuring seven or eight feet in length. It is remarkable for its coloring, the anterior portion and the legs being black, while all the hinder parts of the body are white. In its habits it appears to resemble the other species. It has only been found hitherto in Sumatra, Malacca, and Borneo; but from Chinese books and figures it is supposed that it also exists in some part of China. It appears to have given rise to the popular Chinese superstition as to the miraculous animal called *Me*, which is said to have the trunk of the elephant, the eyes of the rhinoceros, and the feet of the tiger, and which gnaws fire and brass, and feeds on monstrous serpents.

Fossil Tapiridæ.—Nearly allied to the tapirs, and intermediate between them and the swine, is a remarkable group of fossil animals, the remains of which are found abundantly in the gypsum beds of Paris. In the form of the skull they resembled the tapirs, and as the nasal bones are strongly arched, they were doubtless furnished with a short proboscis. The structure of the incisor and canine teeth is also the same as in the tapirs; but the molars were very different in form. All the feet had three toes, which were nearly equal in length. These animals form the genus *Lophiodon*, the *Palæotherium* of Cuvier; their size was sometimes small, but some of the species were as large as a horse. The names assigned to some of these species are *Listriodon*, *Tapirulus*, *Coryphodon*, &c.

Until recently the mammoth and the mastodon were supposed to be the largest of all the ter-

restrial mammalia that ever inhabited the earth; but they must give place to the *Dinotherium*, described by Cuvier as a gigantic tapir, but more recently by Professor Kaup, a distinguished German naturalist, as a new genus between the tapir and the mastodon; and adapted to that lacustrine condition of the earth which seems to have been so common during the deposition of the tertiary strata. Its remains have been found in tertiary strata in the south of France, in Austria, Bavaria, and especially in Hesse Darmstadt. Its length must have been as much as eighteen feet. One of its most remarkable peculiarities consisted in two enormous tusks at the interior extremity of the lower jaw, which curved downward, like those of the walrus. Its general structure seems to have been adapted to digging in the ground; and for this purpose its feet as well as tusks—projecting a foot or two beyond the jaws, which were four feet long—were intended. It lived principally in the water, like the hippopotamus; and it probably used its tusks for tearing up the roots of aquatic vegetables, which, as is shown by its teeth, constituted its food. Dr. Buckland suggests also that these tusks might have been useful as an anchor fastened into the bank of a river, while the body of the animal floated in the water and slept. They might have been useful also to aid in dragging the body out of the water and for defense.



THE COMMON DOMESTIC SWINE.

THE SUIDÆ OR SWINE.

In this family, of which the common hog may be taken as the type, the nose has considerable power of motion, but it is not produced into a proboscis, as in the elephant or even the tapir, nor is it swelled into a blunt rounded mass as in the hippopotamus, but runs into a tapering cylindrical form to the extremity, where it is suddenly truncated. The tip is of a fine cartilaginous nature, and is principally employed in turning up the earth in search of roots and other articles of food. The skull is of a pyramidal form, but the nasal bones are not elevated as in the tapirs; yet the facial bones are very large in comparison with the cranium. The jaws are furnished with the three kinds of teeth while the animals are young, but the incisors are always small, and in some cases fall out with increase of age. The canines, on the contrary, are always of large size, especially in the males, in which they project from the sides of the mouth; those of the lower jaw, from constantly rubbing against their fellows in the upper, are usually sharpened to a most acute edge, and constitute formidable weapons. The molar teeth vary from three to seven on each side in both jaws. The feet consist of four toes, of which the two middle ones are considerably longer and stouter than their fellows, forming a cloven hoof, upon which the animals walk; the two lateral toes are also furnished with hoofs, but they are placed at the back of the foot at some little elevation from the ground. One of these hinder toes is wanting in some cases, while monstrosities have occurred with five toes, and others with a single hoof. The eyes are

small, and the ears of moderate size, and upright. The form of the body resembles that of our ordinary swine, but is lighter and less bulky in the wild species. The tail is rather short and slender; in most cases it is capable of being twisted up into a sort of curl upon the rump. The skin is covered with bristles. Unlike the Pachydermata of the preceding families, which only produce one or at the utmost two young at a birth, the swine are very prolific, bringing forth frequently from eight to twelve young ones. The species are found in the warmer parts of both continents, only one, the common hog, being found wild in the temperate parts of the Old World. They live in the woods and forests, generally in marshy places, and feed partly upon roots and herbage and partly upon animal substances, such as insects and their larvæ, small mammalia, and even upon carrion. The females and young males live together in flocks, but the old boars are usually solitary, except during the breeding season, which they pass in company with the females; and at this period they have tremendous combats among themselves.

Genus SUS: *Sus.*—Of this there are several species: the most important is that of the WILD BOAR, *Sanglier* of the French, *Sus scrofa* of Linnæus, of which all the breeds of *Domestic Hogs* are varieties. This is indigenous to Europe, Asia, and Africa, and though much less abundant than formerly, is still found in the wild and wooded districts of these quarters of the globe. They are of a blackish-brown color, the young, called *marcassins* by the French, being faintly marked with cross-stripes. The bristles along the spine are very coarse, and are erected when the animals are excited, giving them a fierce appearance. All their senses are exceedingly acute. They live in the deep forests, and feed on roots, fruits, herbs, and nuts of various kinds. They pair in January and February, the boars at this period having terrific battles with each other. When all the hostile encounters and other preliminaries are settled, each pair betake themselves to the deep cover of a thicket, where they remain about thirty days. The period of gestation is four months, and the litter consists of from four to ten pigs. When they are produced, the female hides them very carefully from the male, as he would otherwise eat them up. Indeed, when the season is severe, and provision is not easily obtained, the female does not scruple to eat her own offspring. This sometimes happens in the case of the domestic sow, and Shakspeare mentions, among the fitting subjects that go to the composition of a diabolical mess,

"Sow that hath her farrow eaten."

The hunting of the wild boar was formerly the chosen amusement of the higher gentry of Europe. The power and fierceness of the animal rendered the chase hazardous, and this constituted a fitting relish to the sport of a rude age. Nobles, princes, and even kings heretofore delighted to take the field with the boar-spear and peril their persons in hunting this fierce animal. Nor was the hunt the only object, for the flesh is excellent, even superior to that of the domestic animal. As history informs us, the huntsmen who pursued the wild boar had keen appetites for the game. At the present day a boar-hunt is rare, though the animal exists in the marshes of Italy, and even in parts of France, Spain, Germany, and Greece.

The DOMESTIC HOG, now distinguished by many varieties, is spread over nearly the whole civilized world. In this country it is everywhere cultivated, and especially in the Western States. Cincinnati* is the center of the pork market of that region; the number killed there annually amounts to several millions. They roam in the woods, feeding on herbage and wild fruits and nuts, till late in the autumn, when they are taken up and fatted on Indian corn. The breeds in use are the *Leicester*, the *Miami White*, the *Yorkshire White*, and the *Kenilworth*, all large kinds, attaining a weight of six hundred to eight hundred pounds when dressed. The *Chinese* or *Siam Hog*, which Gervais considers a distinct species, is a small variety, but it is a great breeder, and has been useful in improving other breeds by crossing. The *Berkshire* is an ancient English breed, of a buff color, with large black spots and black feet; it is justly a favorite. The *Bedford* is also much esteemed, and is extensively cultivated.

* According to the census of 1850, the number of hogs in the United States was about 30,000,000; it doubtless greatly exceeds that number at the present time. It is said that the product of the swine market of Cincinnati alone, in pork, bacon, lard-oil—now become one of the great staples of the West, being extensively used for machinery of all kinds, as well as for other purposes, candles, soap, bristles, &c.—exceeds ten millions of dollars annually.

It is a fact in curious contrast to our times, that Moses interdicted the eating of swine's flesh, and Mahomet, who was a servile and by no means discriminating imitator, followed his example. The ancient Jews, however, understood the flavor of pork, and frequently indulged in tasting it, for many of the most bitter denunciations of the prophets are leveled against this transgression, which, it is evident, was very common. In the time of our Saviour hogs were familiar objects, though, as we are told in one conspicuous instance, a drove of them were given up to devils and ran into the sea. In our day, the hog contributes almost as largely as any other animal to the feeding of mankind; its flesh is the most nutritious of animal food, pound for pound; it is easily kept and easily fattened. Its utility to the poor especially is forcibly put by an English writer in the following terms:

"An Irish laborer and his family, who 'rint a quarther' of a cellar or a garret in some squalid den in the British metropolis, often have a pig in their fraction of an apartment, which eats of the same potatoes, reposes on the same straw, and is in fact, to all intents and purposes, a member of the family, not merely tolerated, but loved and loving; for though hogs are sullen and stubborn animals when one attempts to lead them captive, and require to be pulled backward in order that they may be impelled forward, yet they are susceptible to kindly treatment, and a hog may not only be taught to follow its master, but there have been instances of training them to point at game like dogs, and there is not a country fair in England where the powers of 'Toby the wise pig,' in the mysteries of divination, are not the marvel of the rustics.

"It is not, however, for the purpose of playing the pointer, or astonishing the natives with the wisdom of Tobias, that the pig is kept with so much care in the cantonment of the cellar or the garret. It tells a tale of the great and paramount value of the pig to the poor man, and a tale of Ireland—a tale of most monstrous and most heart-rending injustice on the part of somebody—but with the latter we have no concern. The tale of the pig is, that without it the poor man in Ireland could not keep the tenancy of the mud cottage reared by his own hands on the margin of the health-invading bog, that the pig finds the annual impost which the man must pay for being in that state of 'glorious independence,' in which no wind can blow upon him with a more bitter blast, and no contingency of events can despoil him of a single comfort.

"Now, if the hog is thus, as the case of millions has proved, a sheet-anchor by which man can ride out the topmost bent of misery's tempest, how well may it serve those who can have it all to themselves! This of itself gives a popular interest to the animal far above that which is possessed by the veriest marvel in mere natural history. Nay, there is more depth of pathos and force of moral and social instruction in a single hog, circumstanced as we have mentioned, than in all the formal zoological collections on the face of the earth."*

In our country the hog is not thus a matter of stern necessity, but it is still difficult to conceive how the southern and southwestern plantations, the laborers of which are largely fed on bacon, could be sustained without this animal. What would the epicure do without hams—*Westphalian*, *Virginia*, *Sugar-cured*—and what are quite as good, the hams salted and packed in the good old homespun way by the farmers of New England? What would the country tavern do, in that long lent of summer which besets it, during which fresh beef and mutton and veal are unknown to the larder, without that universal stand-by, fried ham and eggs? What would become of us all if we were to adopt the law of Moses and eschew hogs' lard—that magic spell of the kitchen, which imparts such a relish to fish, flesh, and fowl? A celebrated French cook has authoritatively pronounced the hog to be the "*Prince of the Kitchen*," and philosophers of note tell us that this animal was the very first that man domesticated and killed for his use. A keen satirist, profoundly versed in human nature, in a fable upon the origin of cruelty, represents man in a state of perfect innocence, and with hands all unstained by the blood of a single living creature, ranging the wild woods, contending with monkeys and macaws for "fruits in their seasons," and with the wild hogs for fern and other roots, when no fruit was to be found. Whether the rivalship occasioned any jealousy of the hog, and beech-mast had any influence in making man more cruel and carnivorous, is not said, though it is not impossible, and would add to the truth of the

* British Cyclopedia of Natural History.



WILD HOGS.

application and the force of the moral. But upon one day of more than ordinary appetite, man eyed with complacence the sleek rotundity of a fat hog, and the longer he gazed the more ardent waxed his desire of making a mess of the unsuspecting animal. Invention—for the author did not call in the aid of the devil to bear the burden of the crime, if crime it was—set about finding the means of making a meal of the hog. The bow was made and strung, the arrow was pointed; the bow was bent, the arrow set on the string—and,

"He twangs the bow, the hissing arrow flies,
And darkness seals the gentle porker's eyes."

Once tasting the luscious flesh of the hog, man could no longer be contented with the beech-mast and the acorns, but soon began to "kill and eat" the whole of living nature around him. Nor was he content till he had numbered the flesh of his own race among the dainties of his board. As he became more refined, the disposition to eat his fellow-men became weaker; but the killing propensity has continued, and the slaughter of mankind, so that it is carried on upon a scale of sufficient grandeur, is above all others the work for which man is especially "covered with glory."

Charles Lamb pays quite as great a compliment to pork, and more especially to roast pig, in his ingenious and humorous account of the manner in which this delicious viand was first discovered. He represents a Chinese youth, by the name of Bobo, as perceiving a most exciting odor issuing from the blazing ruins of his father's cottage. This he finds to proceed from one of the pigs, a whole litter of which had been roasted in the conflagration. Strongly tempted, he ventured to taste, and was entranced at the result. He now devoured all the rest of the roasted pigs, and finally set fire to a great number of cottages, so as to enjoy the repast of the young porkers baked in the blaze. At last his father discovered the secret, and ere long it was communicated to the world, and thus for ages mankind have enjoyed the most delicious of viands—roast pig.

The Bene, *Sus Papuensis*, is very small, being but three feet long when full-grown, and is of a delicate and graceful form. The bristles are thick and short, yellowish-brown above, and white annulated with black below. It is found wild in the forests of New Guinea; the Papuans prize its flesh highly; they kill it for food and catch the young ones, which they reduce to partial domestication. It seems to be intermediate between the peccary and the true hog.



THE GUINEA HOG.

The Guinea Hog or Bosch-Vark, *Sus Guineensis* or *Choiropotamus pictus*, is found in Guinea, and is so fond of the water as to be called *The River Pig*. It is of the size of a common hog; has long, narrow, straight ears, with a pencil of hair at the tips. It is of a lively cinnamon-red, with white patches above and below the eyes, and with longitudinal bands of white on the back. The

face is partly black, and the tail is long, reaching below the knee. Specimens of this kind are in the menageries of London and Paris. The name *Choiropotamus* having been applied to an extinct species, that of *Potamochœrus* has recently been given to this species by Gray.

The Masked Boar, *S. larvatus* of F. Cuvier, *S. Africanus* of Schreber, has tusks like the common hog, but on each side of the muzzle, near the tusks, is a large tubercle, supported by a bony prominence, which imparts a singular physiognomy to the animal. It inhabits Madagascar and the south of Africa



THE BABIRUSSA.

The Babirussa, *S. babirussa*, has rather slender, long legs, and is of a grayish color above, with a tint of fawn below. The upper tusks come through the skin of the muzzle and turn circularly backward, the points sometimes reaching the skin again in their downward progress. These are useful only for warding off the bushes; the lower tusks, which are long and turn backward, are powerful weapons of defense and offense. This species is found in the island of Borneo, as well as some other islands of the Indian Archipelago.

Genus PHACOCHŒRUS: *Phacochœrus.*—This includes two species called Wart-Hogs, which have some resemblance of form to the hippopotamus. They are more exclusively herbivorous than the true hogs; they have enormous heads, broad snouts, and large tusks directed upward. The feet and legs are like the true hogs.

The Haraja or Hallup, or Ælian's Wart-Hog, *P. Æliani*, is a native of North Africa, Kordofan, and Abyssinia. The skin is of an earthy color and scantily bristled; a mane of thin hairs, ten inches long, extends along the neck and between the ears. The eyes are small; the tail is nearly bare, thin, and tufted at the end. There are two skinny warts, one small and the other large, on each cheek. Hence the popular name of the animal.

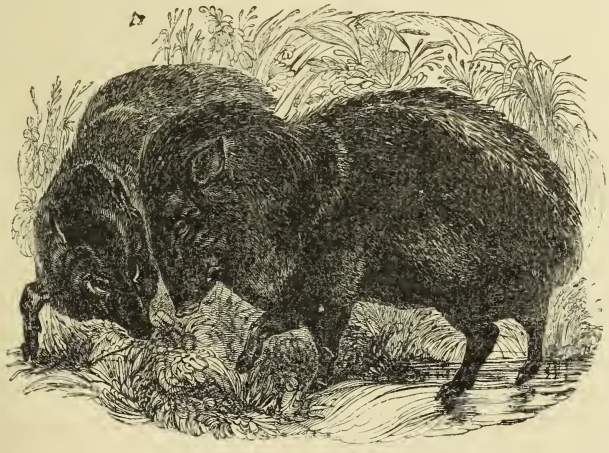
The Cape Wart-Hog, Black Bark, Valke-Vark, or Emgallo, *P. Æthiopicus*, resembles the preceding, but the warts are larger, and the head still more uncouth in its form. Specimens of this have been in the Zoological Gardens of Antwerp and London.

Genus DICOTYLES: *Dicotyles.*—This includes the only indigenous kinds of swine of America, the common hog having been unknown on this continent until it was introduced by Europeans. The peccaries have the canines in the ordinary manner, and not protruding from the mouth in the form of tusks; the incisors and molars are similar to those of the common hog; two great peculiarities of the genus are a glandular opening on the loins, secreting a fetid humor, and an entire destitution of tail. There are two species. Both resemble the common hog in their form, structure, habits, and propensities. Their gait is almost precisely similar; they root in the earth



THE CAPE WART-HOG.

after the same fashion; eat and drink in the same swinish manner; are fond of the same description of food—roots and fruits, with fish and serpents when they are met with; they elevate their long bristles like the hog when terrified or angry; breathe with the same violent effort; and express their feelings with the same peculiar grunt. When taken young they readily become habituated to the society of man, take as much delight as our pigs in being scratched and rubbed, and are speedily reduced to a state of complete subservience. They are not, however, likely ever to become so useful in the farm-yard, for—not to speak of their fetid gland, which is very offensive,



THE COLLARED PECCARY.

and is said to communicate a very disagreeable savor to their flesh if not removed immediately after death—the flesh itself is decidedly inferior to pork both in flavor and fatness, and they are far less prolific than the hog, the female producing but once a year and two at a birth. They are more or less common in Mexico and South America, inhabiting the thickest and most exten-



SHOOTING PECCARIES IN SOUTH AMERICA.

sive forests, and dwelling in the hollows of trees or the deserted burrows of other animals. When living in the vicinity of towns and villages, which, however, is rare, they do great mischief among the fields of Indian corn, sugar-cane, manihot, and potatoes.

The Collared Peccary, *D. torquatus*, is the *Patira* of Sonnini and the *Taytetou* of Azara. It is rather less than three feet long and seldom weighs over fifty pounds. Its general color is a yellowish-gray; a whitish line runs down the shoulder obliquely toward the neck resembling a collar, thus giving its distinctive name. This species lives in pairs or small families, usually continuing to inhabit the same forests in which it was born. Its odor is so strong as to infect the air through which the herds pass, and hence the hunters are able to trace them by their scent.

The White-lipped Peccary—the proper *Peccary* of South America, the *Tagnicati* of Azara—*D. labiatus*, is larger than the preceding; it is also of a thicker and stouter form, with shorter legs and a longer snout. The color is a blackish-gray; the under lip, sides of the mouth, and upper surface of the nose, white. The young are faintly striped. This species lives in large bands, sometimes amounting to a thousand, and stretching out for a league, migrates from one district to another. If they come across a plantation they devastate it by rooting up its crops; when they meet any thing unusual they are thrown into great alarm, which they express by a clatter of the teeth. If a hunter ventures to attack one of these herds, he is sure to be torn in pieces by the infuriated throng, unless he take to a tree or escape by flight. When excited by rage their eyes flash, they rub their snouts together, erect their bristles, and fill the air with their cries. This species is said to have a less offensive smell than the preceding.



THE SYRIAN DAMAN.

THE HYRACIDÆ.

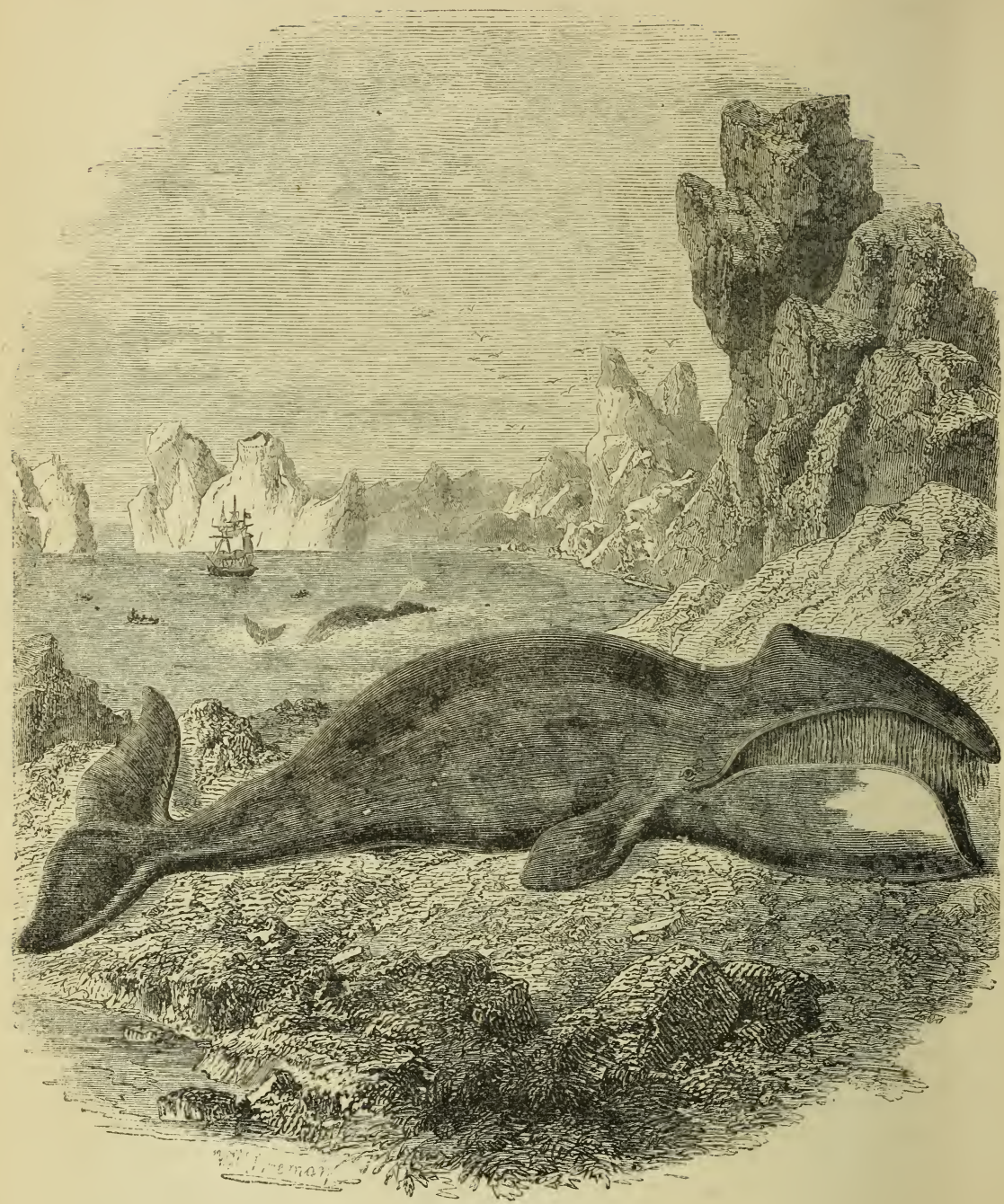
The animals of this family, called DAMANS, are about the size of a hare, and on account of their general appearance have been regarded as belonging to the Rodentia, but their dentition and osseous structure place them clearly among the Pachydermata, and between the rhinoceros and tapir. There is but the single genus, DAMAN or HYRAX, *hyrax;* of this there are several species.

The SYRIAN HYRAX or DAMAN, *Hyrax Syriacus*, is a foot long, of a brownish gray color above and white below. The skin without the hair is of a blackish violet. It is gregarious, lives in caves, and is a mild, timid, and feeble creature. It delights to gather by dozens around its dwellings and bask in the sun. It is found in Syria, Mount Sinai, and Abyssinia, and is supposed to be identical with the *Ashkoko* of Bruce. There is little doubt that it is the *Saphan* or *Shaphan* of Scripture, translated *coney*, in Proverbs xxx. 26: "The conies are but a feeble folk, yet make they their houses in the rock."

The KLIPDAS, *H. Capensis*, is found at the Cape of Good Hope, inhabiting the hollows and crevices of rocks. It feeds on herbs, grass, tops of flowers, and young shoots, particularly of aromatic plants. It lives in families on the rocky slopes of hills and mountains, sometimes near the sea; it is shy and wild, and when abroad keeps an old member of the flock on the look-out as a sentinel; when he sees any thing dangerous he gives the alarm by a shrill cry. It is very clean and neat in its habits. The flesh resembles that of the rabbit.

Another species, the TREE-DAMAN, *H. arboreus*, is found in Western and Southern Africa, and in Mozambique. It is of the size of a large rabbit. Specimens of the three preceding species have been in the London Zoological Gardens.

Two other species are mentioned, the DONGOLA DAMAN, *H. ruficeps*, and the EIWIA or FOREST DAMAN, *H. sylvestris*.



THE GREENLAND WHALE.

ORDER 12.—CETACEA.

We have hitherto been occupied upon the land, or if sometimes led into the water, it has been only in rivers and lakes or along the shores of the sea, and then but casually; we now enter the sea as the permanent abode of the animals whose characters we have to study. This order, the Cetacea, which includes the numerous species of Whales and a multitude of allied animals, is

distinguished by the fish-like form of its members, which are thus adapted for passing their existence in the water. They are generally very bulky creatures, the head being often of an enormous size; the body tapers off posteriorly, and is terminated by a broad tail-fin, which, like that of the fishes, is the principal agent in swimming, but is set on in the contrary direction, being horizontal instead of perpendicular. This caudal fin is supported upon a firm cartilaginous basis, but has no trace of rays or bones. The anterior limbs are converted into powerful fins, completely inclosed in a uniform skin; but beneath this we find the usual bones of which the arm of a vertebrated animal is composed, although considerably shortened. In some instances the phalanges are very numerous, but the fingers rarely exhibit any traces of nails. The posterior limbs are entirely wanting.

The head is not separated from the body by a neck, although the cervical vertebræ are distinctly marked in the skeleton; the great bulk of the head is made up of the facial bones, the cranial portion being often very small. The nostrils are sometimes, as in other vertebrated animals, placed on the fore part of the nose; but in the typical forms, these orifices are brought quite to the top of the head, constituting what are called the *blow-holes* of the whale. The external ear is entirely wanting, and the mode in which the auditory of the organs of the Cetacea are adapted for the perception of sounds, both in the water and in the air, is very interesting. The external aperture of the ear is exceedingly small, so as to prevent any injury to the organ from the rush of water when the creature is progressing rapidly through that element, although it apparently allows of sufficient access of water for the communication of any sounds that may be transmitted by its means. The air penetrates into the ear through the Eustachian tube, which is of large size, and opens into the blow-hole; and thus, when the whale is at the surface of the water and breathing, aerial sounds can find their way into the ear. The eye is of very small size when compared with the bulk of the animal, and, from the immense development of the facial bones, it often appears to be placed nearly in the middle of the body.

The skin is naked, or only sparingly covered with scattered bristles; but to make up for the want of the ordinary clothing of the Mammalia, the whole surface of the body beneath the skin is covered with a thick coating of fat, or *blubber* as it is termed, which forms a most efficient agent in preserving the temperature of the body, at the same time that it reduces its specific gravity. It is this blubber, which is often present in enormous quantity, that forms the principal object for which these creatures are pursued. The Cetacea are all inhabitants of the sea. They are divisible into two very distinct groups, the Cete, which include the *Whales*, *Narwhals*, *Porpoises*, *Dolphins*, &c.; and the Sirenia, which include the *Manatee*, *Dugong*, &c. The great distinction between these two groups or sub-orders is, that the former lives on animal food, and the latter is herbivorous.

THE CETE.

The animals of this division were anciently regarded as fishes, but they are true members of the class Mammalia. Some of them are the largest of known animals. They have a large head, forming nearly one-half the body; the mouth is wide and armed with conical teeth, except in one family, the *Balænidæ;* the mammæ are two, and placed on the belly; the nostrils, sometimes two and sometimes one, are on the top of the head. These do not serve as organs of smell, but only as respiratory openings, through which the water, taken in while the animal is beneath the surface, is ejected. Though living on animal food, the stomach is complex, consisting of four apartments, and sometimes of as many as seven; the skin is naked. These animals have no voice; the period of gestation is nine or ten months; they produce the young alive, and suckle them for a considerable period; they are sociable creatures, and live in large shoals, often sporting on the surface of the water. They are most abundant in the Arctic and Antartic Seas. The Cete are divided into three families, the *Whalebone Whales*, the *Sperm Whales*, and the *Dolphins*.

THE WHALEBONE WHALES OR BALÆNIDÆ.

In these, which constitute the true whales, the upper teeth are deficient, but in their place there are several longitudinal rows of horny plates called *Baleen* or *Whalebone*, set cross-wise, and

hanging down from each upper jaw into the cavity of the mouth below, which, to make place for them, is also destitute of teeth. When the mouth is shut these plates are inclosed on the outside by the upper lip, and the tongue lies between the two rows. These plates, which are fastened at their base in the roof of the mouth, are hardly more than one-fourth of an inch apart, and their inner edges are fringed. This curious device is admirably suited to the wants of the animal; it lives on small marine crustacea and mollusca, and is said never to take in any thing larger than a herring. Indeed, its throat is so small that it cannot swallow larger objects. It swims along in the water where myriads of these minute animals are moving and ingulfs a whole shoal of them at once. The water is strained off, as by a sieve, through the spaces between the baleen, and is discharged at the sides of the mouth, or through the blow-holes, but all the animals, even the minutest, remain in the mouth. Thus, by this capacious net, the whale is enabled to make a meal suited to his enormous bulk, though his prey consists of creatures often not larger than insects!

Of this family there are several genera. The first is the BALÆNA: *Balæna.* This includes several species, the most important of which is the Right Whale or Greenland Whale, *B. mysticetus*, the *B. Greenlandica* of Linnæus. This has long been an object of pursuit by the whalers, and a large fleet of vessels from Europe, mostly English, with many from America, are annually dispatched to the north seas for its capture. The largest are near seventy feet long. The tail of a large whale measures about twenty or twenty-five feet in breadth and five or six feet in length; by the action of this powerful instrument it can dash off with immense velocity when wounded or alarmed, and sometimes with a single blow from it, completely shatters the boat of its pursuers. Its pace at ordinary times is about four miles an hour, and it appears rarely to swim at any great depth in the water. At times, for amusement, these enormous creatures will spring completely out of the water, and another of their diversions consists in immersing the whole body perpendicularly and flapping their immense tails on the surface of the water, so as to produce a sound that may be heard at a distance of two or three miles. They hear acutely any noise under the water, but disregard sounds made in the air. They seldom remain on the surface to blow more than two minutes, during which period they blow eight or ten times; they then dive for ten or fifteen minutes, when they rise again.

The Greenland Whale is found in most parts of the Arctic seas, but its exact limits are not known, as it has probably often been confounded with the other species of *Balæna.* It is generally met with alone or in pairs, excepting when many individuals are attracted to some abundant feeding-ground or to a desired locality, such as the vicinity of icebergs. The fishery is principally carried on in Baffin's Bay, and by the English, who are calculated to have a capital of at least a million sterling embarked in it. The ships reach their stations about the end of April, and immediately begin looking out for whales. As soon as one of these creatures is perceived from the mast-head, the boats, of which each ship carries six or seven, are lowered and manned for the pursuit. When one of them arrives sufficiently close to the enormous animal, the harpooner, who stands at the head of the boat, plunges his weapon into its body, and the rowers immediately back out of harm's way. The whale suddenly dives down with such velocity that, when he has taken a perpendicular direction, he has been known to fracture the bones of his head against the bottom at a depth of eight hundred yards; but more commonly he makes off for the shelter of an ice-field, dragging out with him the line to which the harpoon is fastened, and this passes so rapidly over the edge of the boat that it is necessary to keep it constantly wet to prevent its taking fire. The lines are usually about four thousand feet in length, but the whale often takes out three or four times this length of line. The wounded whale usually remains under water for about half an hour, but sometimes much longer, and an instance is recorded in which the creature was an hour and a half before coming up to breathe. On his reappearance he is again attacked with harpoons and spears, by which he is soon dispatched, the destruction of one of these monsters of the deep rarely taking more than an hour. The body is then towed to the ship's side, where the process of *flensing*, or cutting off the blubber and removing the baleen, is performed, and when this is completed, the carcass is left to the tender mercies of the white bears, waterfowl, and sharks.

The blubber covers the surface of the whale to a thickness of from eight or ten to twenty

inches, and that of a large whale will weigh about thirty tons, furnishing from twenty to twenty-five tuns of oil. Whales have been taken which gave thirty tuns of oil. The whalebone or baleen is also an important part. The longest laminæ in a large whale usually measure about fourteen feet in length, but the greater part are shorter: the width of each plate is 12 to 15 inches. The whole quantity obtained from one animal weighs sometimes as much as three thousand pounds. The number of plates is usually about three hundred in each of the outer rows, but large individuals have been found with four hundred in each row.

To the Esquimaux and the Greenlander this species is all important. They eat the flesh and fat with indescribable relish. The membranes of the abdomen serve them for clothing, and the thin, transparent peritoneum admits light through the windows of their huts while it keeps out the weather. The bones are made into props for their tents, or aid in the formation of their boats, and supply them with harpoons and spears for the capture of the seal and larger sea-birds. The sinews, divided into filaments, are used as thread for sewing their dress, &c. Some have stated that pickled and boiled blubber is palatable, and that the tail, first parboiled and then fried, is agreeable eating. The flesh of the young whale is said to be by no means indifferent food. To civilized nations the oil made from the fat or blubber and the whalebone have long made the whale a great commercial object.

The affection of the female for her offspring is great. The young whale, when just born, measures from ten to fourteen feet in length, and for a twelvemonth or more after its birth it remains in close attendance upon its mother. It furnishes but little oil, and the whalers, therefore, do not care to take it for its own sake; but as it is easily harpooned, it is frequently struck in order to attract the mother to its assistance. Mr. Scoresby gives an interesting account of the devotion of the parent to its young under these circumstances. He says: "In June, 1811, one of my harpooners struck a sucker, with the hope of its leading to the capture of the mother. Presently she arose close by the 'fast-boat,' and, seizing the young one, dragged about a hundred fathoms of line out of the boat with remarkable force and velocity. Again she arose to the surface, darted furiously to and fro, frequently stopped short, or changed her direction, and gave every possible intimation of extreme agony. For a length of time she continued thus to act, though closely pursued by the boats, and, inspired with courage and resolution by her concern for her offspring, seemed regardless of the danger which surrounded her. At length, one of the boats approached so near that a harpoon was hove at her. It hit, but did not attach itself. A second harpoon was struck; this also failed to penetrate; but a third was more effectual, and held. Still she did not attempt to escape, but allowed other boats to approach, so that in a few minutes three more harpoons were fastened, and in the course of an hour afterward she was killed."

The *Nord Kapper* or *Nord Caper* and the *Rock-nosed Whale* are varieties of the preceding.

The Western Australian Whale, *B. marginata*, has very long and slender baleen, with a rather broad, black edge on the outer or straight side. From the character of the baleen Dr. Gray considers this a distinct species.

The Cape Whale, *B. Australis*, is the *Right Whale* of South Sea whalers; the *Southern Whalebone Whale* of Nunn; the *Common Black Whale* of Sir James Ross. It inhabits the South Seas, and is of a uniform black color. It is of large size, and great numbers of it are taken near New Zealand and the Cape of Good Hope.

The Japan Whale, *B. Japonica*, is an inhabitant of the coasts of Japan, which it visits periodically. Its head is covered with barnacles.

The New Zealand Whale, *B. antarctica*, is the *Tuku Peru* of the natives.

The Scrag-Whale, *B. gibbosa*, is regarded as a species by Dr. J. E. Gray. It is an inhabitant of the Atlantic Ocean, and is near akin to the Finback, but instead of a fin upon its back, the ridge of the after part of its back is scragged with half a dozen knobs or knuckles.

The remaining genera of the *Balænidæ* have either fins or humps on their backs, and are called *Hump-backs* and *Finners*.

The *Genus* MEGAPTERA: *Megaptera*, includes the *Hump-backed Whales*. They are easily known from the *Finners* in being shorter and more robust, the skull nearly one-fourth the entire length, the head wider between the eyes, the mouth larger, the lip warty, and the nose large and

rounded; the plaits of the belly and throat are broad. The skull is intermediate between that of the *Balæna* and *Balænoptera*.

Johnston's Hump-backed Whale, *M. longimana*, is an inhabitant of the North Sea, and has been taken at the mouth of the Maas. It is the *Balæna longimana* of Rudolphi, and the *Balæna Boops* or *Keporkak* of Eschricht, who says it is the most common whale in the Greenland seas.

The Bermuda Hump-Back, *M. Americana*, is of a black color, with a white belly, and has its head covered with tubercles. It is found at Bermuda from March to the end of May, when it departs. The baleen of this whale is extensively imported from Bermuda.

The Poeskop or Cape Hump-Back, *M. Poeskop*, is the *Rorqual du Cap* of Cuvier, and the *Hump-backed Whale* of Ross's "Antarctic Voyage." It is an inhabitant of the seas of the Cape of Good Hope.

The Kuzira, *M. Kuzira*, inhabits the Japanese seas.

Genus BALÆNOPTERA: *balænoptera*, includes the *Finners*, which are marked by a soft dorsal fin. Of this a well-known species called the Pike-Whale, *B. rostrata;* the *Rorqualus rostratus* of Dekay; the *Rorqualus Boops* of F. Cuvier. It is of a black color; underneath of a reddish-white. It inhabits the North Sea, and has been found in New York Bay, at Valognes in France, and a specimen was taken in the Thames at Deptford.

The Razor-Back, *Physalus Antiquorum*, is of a slate-gray color, whitish beneath; the baleen is slate-colored. This species is an inhabitant of the North Sea, and is sometimes found a hundred feet long, being in fact the longest species of known animals. One of this kind was found floating in Plymouth Sound, England, on the 2d of October, 1831. It is stated to have been one hundred and two feet long and seventy-five in circumference. This specimen was taken round the country as a show in three caravans.

The *P.* (*Rorqualus*) *Boops* of Gray has been taken off the coast of Wales. The length of a specimen in the British Museum is thirty-eight feet; the head is nine feet long; the vertebræ are sixty in number, and there are fifteen pairs of single ribs.

The *P.* (*Rorqualus*) *Sibbaldii*. A specimen of this species, fifty feet long, exists in the museum at Hull, England.

The Peruvian Finner, *P. fasciatus*, described by Tschudi, has been found on the coasts of Peru.

The Japan Finner, *P. Iwasi*, is very rare; one was cast ashore at Kii in 1760; it was twenty-five feet long.

The *P. antarcticus;* this is named from the baleen of a New Zealand species by Dr. J. E. Gray.

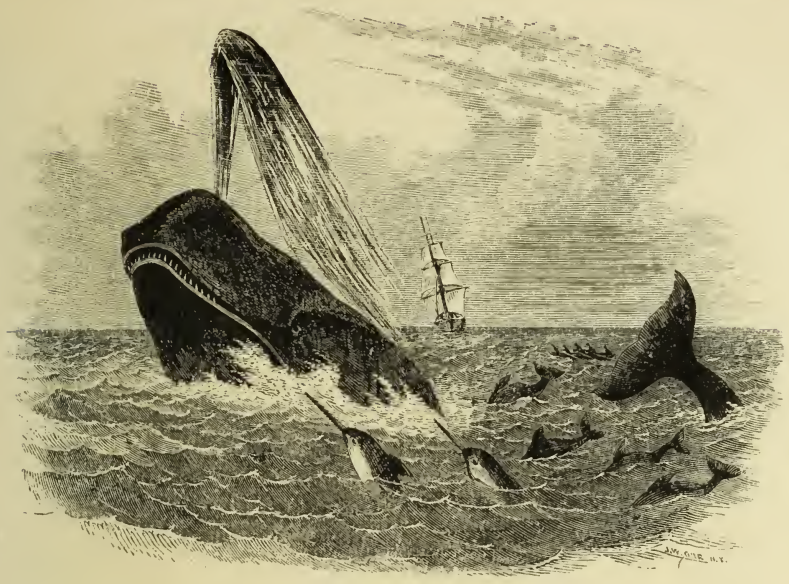
The Bahia Finner, *P. Brasiliensis*, is named from baleen brought from Bahia.

The Southern Finner, *P. Australis*, inhabits the seas of the Falkland Islands.

THE CATODONTIDÆ OR SPERM-WHALES.

This family, called *Toothed Whales*, are distinguished from the true whales by the absence of baleen plates, and the presence of from forty to fifty conical teeth in the lower jaw. This is shorter and narrower than the upper jaw, so that when the mouth is closed it is completely inclosed by the upper jaw. The teeth fit into cavities of the upper jaw, which although not quite destitute of teeth, possesses these organs in a very rudimentary condition, and concealed in the gums. The head, as in the true whales, is of enormous size, forming about one-third of the entire length of the animal, and its form is very remarkable. It is nearly cylindrical, and singularly truncated in front, and the blow-hole, instead of being placed on the forehead, is situated on the anterior portion of this immense snout. The mass of this part of the head is not composed of bone, but of a sort of cartilaginous envelope, containing an oily fluid, which hardens by exposure to the air, and in this state is well known as *spermaceti*. This substance is also diffused through the blubber.

The *Genus* CATODON, *Catodon*, includes the only well known species—the Sperm-Whale, or Spermaceti Whale, or Blunt-headed Cachalot, *C. macrocephalus*, the *Physeter macrocephalus* of Linnæus. Its color is black above and white below. It is very generally distributed in all seas, but principally in those of the southern hemisphere. The male is of immense bulk, usually measuring about sixty feet in length; and specimens have been met with no less than seventy-



THE SPERM-WHALE.

six feet long, and thirty-eight in circumference. The females are much smaller, usually measuring from thirty to thirty-five feet in length.

They inhabit deep water, and very rarely approach the land. Their food consists principally of cuttle-fishes, which swarm in great profusion in the southern seas. They usually swim in flocks, called *schools* and *pods* by the whalers, consisting of from twenty to fifty females and their young, accompanied by one or two old males, to which the seamen give the name of *bulls*. They are taken in great numbers, as the oil obtained from their blubber is the finest of the animal oils, and is much used for burning in lamps, and the oily matter from the head—*spermaceti*—is also of great value, both as an ointment and for the manufacture of candles. Another substance of still greater value, obtained from the sperm-whale, is the well-known perfume called *Ambergris*. This is a morbid concretion formed in the intestine of the sperm-whale, either in the stomach, or more probably in the gall-ducts, as in its nature it appears to resemble a gall-stone. It forms masses of considerable size, sometimes as much as thirty or forty pounds in weight; and is usually found floating upon the surface of the water, probably disengaged from the decomposing body of one of these monsters. The whalers rarely seek for it in the intestines of the sperm-whales which they kill, although its value is about five dollars an ounce. It has the singular property of increasing the power of other perfumes when mixed with them, and it is for this purpose that it is principally employed.

Valuable as these creatures are, their pursuit is attended with danger in fully equal proportion. They are harpooned from boats in the same way as the true whales, and, like these, frequently use their tails as most formidable offensive weapons; but in this case the other members of the flock will often come to the assistance of their wounded comrade, and thus add greatly to the peril of the boatmen. There are cases on record of men being struck out of the boats and killed by the powerful tails of these creatures; and in other instances the whales have been known to rush against the ships with such violence as to spring leaks, which have caused them to sink within a few hours. The ship Essex, of Nantucket, was struck in this way, and three of the men only were saved after rowing several weeks in open boats. The Americans, who take a leading part in the whale fisheries throughout the world,* are particularly successful in capturing the sperm-whale, which they pursue in various parts of the Pacific Ocean.

* New Bedford, in Massachusetts, is the center of the American whale fisheries, which employ together, about seven hundred sail of vessels, of two hundred thousand tons, and fifteen thousand men. Whales are captured by them on the American coasts, the coasts of Africa, in the Arctic Seas, and in the Pacific Ocean.



GREENLANDER SPEARING A NARWHAL.

Other species of spermaceti-whale are mentioned as follows:

The Mexican Sperm-Whale, *C. Colneti*, an inhabitant of the North Pacific, the South Seas, and equatorial oceans, and often referred to the last species.

The South Sea Sperm-Whale, *C. polycyphus*, is found in the Southern Ocean, and often spoken of as the Cachalot or Sperm-Whale.

Genus KOGIA: *Kogia*.—This name is given by Dr. J. E. Gray to a form of whale with a shorter head, which has been taken at the Cape of Good Hope.

The Short-headed Whale, *K. breviceps*, of Gray, is the only species, and has been described from a single skull in the Paris Museum. It has been regarded by some as the young of the Sperm-Whale.

Genus PHYSETER: *Physeter*.—This is the generic term applied by Linnæus and many subsequent writers to the Sperm-Whale, but it was originally applied by Artedi to the Blackfish, to which Dr. J. E. Gray has restored it in the British Museum Catalogue.

The Blackfish of Gray, *P. Tursio*, probably the *Delphinus globiceps*, or *D. grampus* of Cuvier, is of a black color; one taken off the coast of Scotland was fifty-two feet long.

THE DELPHINIDÆ.

The Delphinidæ or *Dolphins*, the family of which the Dolphin is the type, and which includes not only the *Dolphin* but the *Porpoise*, &c., are more numerous than those of the other Cetacea. They are distinguished from the last family by the smaller and more proportionate head; and in those species which have lost their upper teeth at an early age, by there being no regular pits in the gums of the upper jaw for the reception of the teeth of the lower one; and also by the hinder part of the skull not being deeply concave and surrounded on the sides and behind by a high ridge.

The *Genus* HYPEROODON, *Hyperoodon*, presents several species: the Bottle-Head or Beaked-Whale, of Pennant, *H. Butzkopf*, inhabits the North Sea.

The Beaked Hyperoodon, *H. rostratum*, inhabits the North Sea. It differs from the last species in having the dorsal fin behind the middle of the back. It has been taken in the Thames and the Humber, and skeletons exist in the museums of Edinburgh, Bristol, and Liverpool.

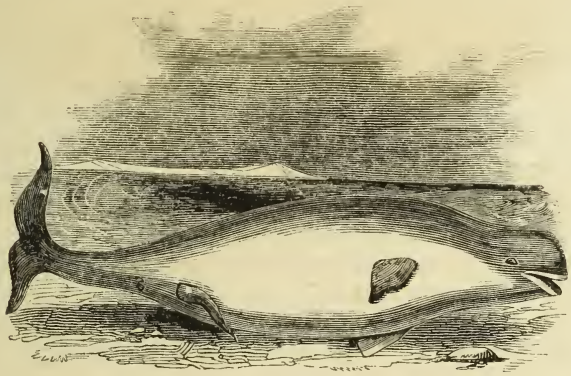
Two other species of Hyperoodon are described by Dr. J. E. Gray, *H. Desmarestii* and *H. latifrons*. The latter is a native of the North Sea, and has been taken on the coast of Lancashire.

Of the *Genus* ZIPHIUS, *Ziphius*, is the *Physeter bidens* of Sowerby, the *Diodon bidens* of Bell. The head of a specimen caught in Scotland is now in the museum at Oxford. Dr. Gray observes that it belongs to the genus *Ziphius* of Cuvier, before only known in the fossil state; and the examination of the skull has proved the accuracy of these determinations.

Z. Sechellensis, named from a skull in the museum at Paris, was brought from the Sechelles.

Genus DELPHINORHYNCHUS: *Delphinorhynchus*.—This presents the *D. micropterus*, first described by De Blainville. It inhabits the seas of the coast of Europe.

Genus MONODON: *Monodon*.—Of this is the NARWHAL, UNICORN, or UNICORN-WHALE, *M. monoceros*. When young it is black, when old whitish-marbled. Although it has sometimes two tusks, it has more frequently one, from which it derives its name of Unicorn. It inhabits the Northern Ocean. The use of the tusk, which is usually found only on the male, and is six to eight feet long, is doubtful; probably, however, it serves as a weapon of defense. The Narwhal feeds on mollusca, and swims with great swiftness; when at the surface it blows repeatedly, and then lies motionless for several minutes. The blubber yields a fine oil, which, as well as the flesh, is considered a dainty by the Greenlanders, who capture the animal with the harpoon. The ivory of the tusk is considered superior to that of the elephant. The celebrated throne of the Danish kings is made of this article.



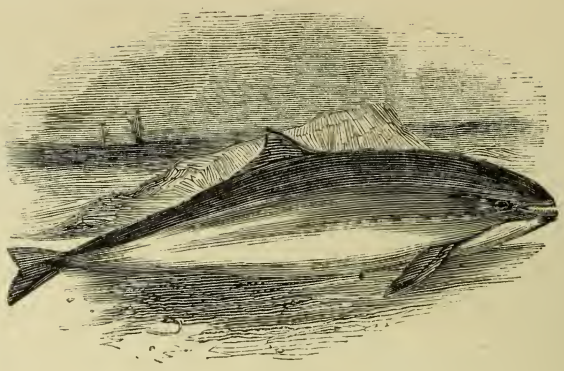
THE BELUGA.

Genus BELUGA: *Beluga*.—Of this is the NORTHERN BELUGA, ROUND-HEADED CACHALOT, SMALL CATODON or WHITE WHALE, *B. catodon*, the *Physeter catodon* of Linnæus. When young it is black, when mature white, sometimes having a yellowish or rosy tinge. It is twelve to eighteen feet long, feeds on fish, and is esteemed good eating by the inhabitants of the northern countries, the seas of which it frequents. It abounds in Hudson Bay, Davis's Strait, and along the shores of Kamtschatka. It sometimes ascends large rivers, and is often observed near Quebec. It is seen in shoals of forty to fifty, which frequently follow ships and frolic in the water around them. They usually flock to the east coast of Greenland, where they are a serviceable supply to the inhabitants. The oil of the Beluga is of the finest quality; the skin of the animal is wrought into morocco, and the internal membranes are used for windows and bed-curtains.

The *B. Kingii* is found near the coasts of Australia.

Genus NEOMERIS: *Neomeris*.—Of this there is a single species, the *N. phocænoides*, a kind of dolphin found in the Indian Ocean.

Genus PHOCÆNA: *Phocæna*.—This includes the COMMON PORPOISE or PORPESSE, *P. communis*, probably the *Tursio* of Pliny, the *Marsouin* of the French, *Porco Pesce* of the Italians, and the *Meerschwein* of the Germans. This is from four to eight feet long, and nearly of a black color above, beneath whitish. They are found in all northern seas, and even in the bays and harbors along our coasts. They swim in shoals, and drive the mackerel, herrings, and salmon before them, pursuing them up the bays with the same eagerness that a pack of dogs hunt the hare. In



THE PORPOISE.

some places they almost darken the sea as they rise above water to take breath; they not only seek for prey near the surface, but often descend to the bottom in search of sand-eels and sea-worms, which they root out of the sand with their noses, in the same manner as hogs when pursuing their food in the field. In fine weather they leap, roll, and tumble in the most joyous manner, principally in the spring and summer, which is supposed to be their pairing season. As they are seen on the surface at such times they appear like black pigs, and hence are often called *Sea-Hogs* and *Hog-Fish*. They go up the rivers in pursuit of the salmon, as well as other fish. The oil of this species is of the purest kind. Their flesh is now very rarely eaten among civilized people, but formerly it was esteemed a great delicacy, and all the arts of the cook were lavished upon it for the tables of the great. The Greenlanders quaff the oil and devour the flesh with high relish.

Genus GRAMPUS: *Grampus.*—Of this is the GRAMPUS, the *Delphinus griseus* of Cuvier, the *Phocæna grisea* of Lesson. It is a large species, measuring fifteen to twenty feet. It is exceedingly voracious, feeding not only upon fishes of various kinds, but even upon some of the smaller cetacea. It is common in the northern seas, and is often seen near the coast of the United States. Other species are as follows: the *G. Rissoanus*, caught near Nice; *G. Richardsonii*, described by Gray in the Zoology of the Erebus and Terror; and the *G. Sakamata*, found on the coasts of Japan.

Genus GLOBIOCEPHALUS: *Globiocephalus.*—This includes the PILOT-WHALE, *G. svineval*, also known to sailors as the *Black Whale*, *Howling Whale*, *Social Whale*, *Bottle-Head*, &c. It is the *Delphinus globiceps* of Cuvier, the *Narwhal Edenté* and *Petit Cachalot* of the French. It is of a black color, with a white streak from throat to vent. It is a native of the North Sea, and has been taken off the coast of Scotland; also at the east end of Long Island and in Long Island Sound. A skull in the British Museum measures twenty-eight inches in length.

The BLACK FISH of the American sailors, *G. intermedius*, inhabits the coasts of North America.

The SMALLER PILOT-WHALE, *G. affinis*, is the *Delphinus melas* of Owen. Its locality is unknown.

G. Sieboldii is a native of the coasts of Japan, where it is called *Naiso-Gota.*

G. macrorhynchus is the BLACKFISH of the South Sea whalers. It inhabits the South Seas.

Genus ORCA: *Orca.*—This includes the KILLER, the *Delphinus orca* of Linnæus, *Grampus* of Hunter, *Delphinus Grampus* and *Large Grampus* of Owen. It inhabits the North Sea, and has been taken on various parts of the British coasts.

The CAPE KILLER, *O. Capensis*—the *Delphinus globiceps* of Owen—inhabits the Southern Pacific Ocean.

O. intermedia is a smaller species, described by Dr. Gray in the Zoology of the Erebus and Terror.

Genus LAGENORHYNCHUS: *Lagenorhynchus.*—This includes the WHITE-SIDED BOTTLE-NOSE, the *Delphinus Tursio* of Knox. It is a native of the North Sea.

The WHITE-BEAKED BOTTLE-NOSE, *L. albirostris*—of which a specimen was taken off the coast of Norfolk, England, in 1846.

The ELECTRA, *L. Electra*, is described by Dr. Gray in the Zoology of the Erebus and Terror.

L. cæruleo albus; this is an inhabitant of the east coast of South America.

L. Asia; described by Dr. Gray in the Zoology of the Erebus and Terror; locality unknown.

L. acutus; inhabiting the North Seas in the region of the Faroe Islands.

L. clanculus; this is described by Dr. Gray from a skull brought from the Pacific Ocean.

L. Thicolea; this is described by Dr. Gray from a skull brought from the west coast of North America.

Genus DELPHINAPTERUS: *Delphinapterus.*—This includes the RIGHT WHALE-PORPOISE of the whalers, *D. Peronii.* It is black, with the exception of the beak, pectoral fins, and under part of the body, which are white. It is found on the Brazil Bank, off New Guinea, and in the higher southern latitudes. They live in large shoals, and the flesh is esteemed a delicacy.

D. Borealis inhabits the North Pacific Ocean. It has been described by Peale in the United States Exploring Expedition.

Genus DELPHINUS: *Delphinus.*—This includes not only the *Common Dolphin*, but many species similar to it: maritime people give to these various names, as *Bottle-noses*, *Bottle-heads*, *Flounder-heads*, &c.; the name *Dolphin* they usually apply to a totally different species, the *Coryphœna hippurus*, which changes color in dying. The COMMON DOLPHIN, *D. delphis*, abounds in all the seas of the northern hemisphere. It measures six or eight feet in length, and is one of the most active species of the family. It is noted for its fondness for accompanying ships in considerable flocks, sporting upon the surface of the water as if for the delight of the beholders. It is said that in these gambols individuals have been known to leap out of the water to such a height as to fall upon the deck of a ship. The ancients were well acquainted with the sportive habits of the dolphin, and regarded it as the special friend of man. It was one of this species that was wont, according to the beautiful Greek fable, to carry Arion on its back through the waves. Other species are as follows:

The HASTATED DOLPHIN, *D. Heavisidii*, inhabiting the South Sea; also near the Cape of Good Hope.

The DUSKY DOLPHIN, *D. obscurus*, inhabiting the Southern Ocean, and near the Cape.

The COMPRESSED-TAILED DOLPHIN, *D. compressicauda*, inhabiting about 4° south latitude, 24° west longitude from Greenwich.

The BOTTLE-NOSE DOLPHIN, *D. Tursio*, inhabiting the North Sea.

The *D. Abusalam*, inhabiting the Red Sea.

The *D. Eutropia*, inhabiting the Pacific Ocean, in the region of Chili.

The *D. Eurynome*, inhabiting the North Sea.

The METIS, *D. Metis;* locality unknown.

The CYMODOCE, *D. Cymodoce;* locality not known.

The DORIS, *D. Doris;* locality unknown.

The BRIDLED DOLPHIN, *D. frenatus*, inhabiting the seas along the Cape de Verd Islands.

The *D. Clymene;* locality unknown.

The STYX, *D. Styx*, inhabiting the coast of West Africa.

The EUPHROSYNE, *D. Euphrosyne*, inhabiting the North Sea.

The ALOPE, *D. Alope;* locality unknown.

The JANIRA, *D. Janira*, inhabiting the region near Newfoundland.

The NEW ZEALAND DOLPHIN, *D. Novæ Zealandiæ*, inhabiting near New Zealand and Cape Gable.

FORSTER'S DOLPHIN, *D. Forsteri*, inhabiting the Pacific Ocean between New Caledonia and Norfolk Island.

The *D. Sao*, inhabiting Madagascar.

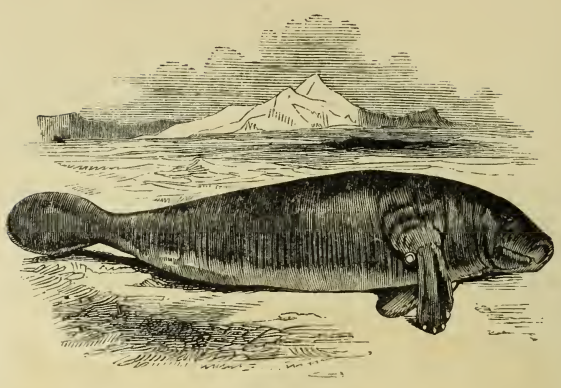
The CAPE DOLPHIN, *D. longirostris*, inhabiting the Southern Ocean, and also near the Cape of Good Hope.

The SMALL-HEADED DOLPHIN, *D. microps*, inhabiting the coasts of Brazil.

Genus STENO: *Steno*, includes the *S. Malayanus*—*Delphinus plumbeus* of Cuvier—a native of the Indian Ocean.

The *S. frontatus*, inhabiting the Indian Ocean and the Pacific.

The *S. compressus*, described by Gray in the Zoology of the Erebus and Terror.



THE MANATEE.

The *S. attenuatus*, found at Cape Horn.

The *S. fuscus*, described by Gray in the Zoölogy of the Erebus and Terror.

The *S. rostratus*, inhabiting the North Sea, and which has been taken at Holland and at Brest.

Genus PONTOPORIA: *Pontoporia*, includes the *P. Blainvillei*, which has been found off Monte Video.

Genus INIA: *Inia*, includes the *I. Geoffroyii*, a native of the shores of Upper Peru.

Genus PLATANISTA: *Platanista*, includes the Sou Sou, *P. Gangetica*, of India—the *Susu* of Buffon, the *Platanista* of Pliny, the *Dauphin du Gange* of Cuvier.

THE SIRENIA.

These animals resemble some of the Pachydermata, and especially the elephants: the nostrils are in front of the snout, and are not used as blow-holes; the head is of moderate size, and the bones are dense and heavy. They inhabit the sea-shores, especially about the mouths of rivers, up which they sometimes penetrate to some distance. They feed entirely upon sea-weeds and aquatic plants, and do not, as stated by some authors, quit the water to pasture on the banks. They are said frequently to support themselves in an upright position, with the upper part of the body out of the water, when they are said to present a somewhat human appearance at a distance, the illusion being assisted by the long whiskers which usually project from the upper lip, and the pectoral mammæ of the females. It is supposed by Cuvier, and many other naturalists, that the lively imaginations of the ancient mariners raised upon this slight foundation the wonderful stories of Tritons and Sirens, Mermen and Mermaids, that we meet with in the old writers. The seals may also have contributed to the same superstitions.

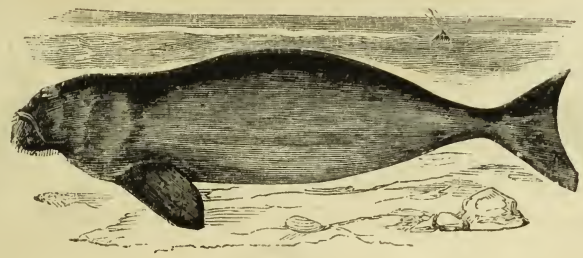
The Sirenia have been variously classed by different naturalists; we shall include them under three genera:

Genus MANATUS: *Manatus.*—This includes the Manatee or Sea-Cow, *M. Australis*—the *Lamantin* of Buffon; *Lamantin d'Amérique* of Cuvier. It is of a gray-black color, nine or ten feet long, and has vestiges of nails on the edges of the flippers, which are used dexterously in creeping and carrying the young. This has caused these organs to be compared to hands, whence their name *Manati* or *Manatee.* They are gregarious, and generally go in troops. The young are placed in the center of the herd for protection, and on the approach of danger all unite for the common safety. It is alleged that, when one has been struck by a harpoon, its companions will tear out the weapon, and they are so attached to their young that if the calf be taken the captors are sure of the mother, from the recklessness with which her maternal affection leads her to the place of capture. If the mother be captured, the young follow her to the shore, and fall an easy prey. The shallow bays of the Antilles and the quiet creeks of the South American rivers, particularly in Guiana and the Brazils, are its favorite haunts.

The *M. latirostris* inhabits the Gulf of Mexico and the coasts of Florida and the West Indies. It is sometimes fifteen feet in length.

The *M. Senegalensis* is about eight feet in length; it is the *Woman-Fish* of Purchas. All these species are pursued with avidity for food; in Brazil they are allowed by the Catholic Church to be eaten as fish on meager days, and hence are much sought after.

Genus HALICORE: *Halicore.*—On the east coast of Africa, and on the shores of the Indian Ocean, the place of the Manatees is taken by the animals of this genus, in which the molars are never more than five on each side in each jaw, while in old animals their number is reduced to two. The form of the upper jaw is very remarkable: it is bent downward in front of the lower jaw, and terminated by two rather large incisor teeth. The tail is notched.



THE DUGONG.

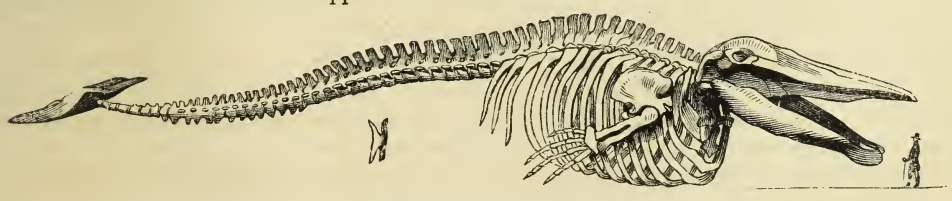
The DUGONG, *H. Dugong*, in its habits resembles the manatees, but it exceeds them in size, full-grown individuals measuring eighteen or twenty feet in length. The natives of the countries near which they live, kill them in considerable numbers, usually capturing them with spears. The flesh is very delicate, and is considered a royal dish by the Malays. Westward this species extend to the Red Sea and the east coast of Africa, but they do not appear to be known north of the Eastern Archipelago, on the coasts of China and Japan. The female produces generally but one at a birth, and to this the mother bears such strong affection that, if it is speared, she will not depart, but is sure to be taken also. The Malays consider this animal as almost typical of maternal affection. The young utter a short and sharp cry, and are said to shed tears, which are carefully preserved by the common people as a charm, under the notion that they will secure the affections of those whom they love, as they attract the mother to her young.

The *H. Tabernaculi*, found in the Red Sea, resembles the preceding, and is considered a distinct species by Rüppel, who named it as above, from an idea that with its skin the Jews were directed to cover the Tabernacle.

The *H. Australis*, the *Manate* of Dampier, is found on the west coast of Australia.

Genus RYTINA: *Rytina.*—Of this there was a single species, the MORSKAIA KOROVA or SEA-APE of Pennant, *R. gigas*, or *R. Stelleri;* it has, however, like the Dodo, become extinct. It was discovered in 1741 near an island in Behring's Straits, where Behring was shipwrecked and where he perished, and was then abundant there. It formed the chief food of the unfortunate mariners who were compelled to spend ten months in that inhospitable region. It was twenty-five feet long and twenty in girth; the skin was thin, soft, and whitish, but was covered by a coat of horny tubes, set thick like hair. These animals were long since extirpated by the adventurers who visited this region in search of sea-otters, and all that now remains consists of a skull and a few fragments of bones in European museums.

FOSSIL CETACEA of several genera have been found, including numerous extinct species; among them there is a skeleton of the *Zeuglodon*, nearly seventy feet in length, found in Alabama, and similar bones are found in Mississippi and Louisiana.



SKELETON OF THE WHALE.



KANGAROOS.

ORDER 13. MARSUPIALIA OR MARSUPIATA.*

This order derives its name from *marsupium*, the Latin for purse or bag, the females of the several species which constitute it having under the belly a pouch or sac, in which the young, which are born in a very immature state, are received and nourished, and whither they retreat long after they are able to move about. The physiology as well as the osseous structure of all these animals must of course be adapted to this most curious system; but in other respects they vary greatly in size, form, and habits. The species are mostly confined to Australia, that strange quarter of the globe, where cherry-stones grow on the outside of the pulp; where the big end of a pear is attached to the stalk; where nettles, ferns, and grasses grow into trees, and lilies, tulips, and honeysuckles assume almost the substantial form of oaks. Before the discovery of New Holland, the Europeans had become acquainted with the opossum in America, and we may conceive their

* Some naturalists divide the Mammalia into two groups, the *Placentaria* and *Aplacentaria*. In order to show the reason of this, it is necessary to say that it is well established that in the *production*, or, more properly, the *reproduction* of life, vegetable as well as animal, it is necessary that the *Germ-cell* and the *Sperm-cell* should combine, the principle of growth being in the latter, and communicated to the former by this union, in which the germ-cell is penetrated by the filaments of the sperm-cell. The germ-cell in the mammalia is the simplest form of what we call an *Ovum* or *Egg*, provided by the ovary of the female; this being fecundated by the sperm-cell, is brought into the uterus, where it gradually grows into the living being which, at the proper time, is born. During this process of growth, it is connected with the womb by the *Placenta*, and through this it maintains its connection with the mother and obtains nutriment for its support and growth. The animals thus nursed by means of the placenta, are all brought to a state of greater or less maturity before birth, and hence those subject to this system are called *Placentaria*. In this division all the animals noticed in the preceding pages are included. But we are now about to examine another division, the *Marsupiata*, in which, though the origin of reproduction is the same as we have described, the young, instead of being nursed to maturity by means of a placenta, are brought forth while yet in embryo, and are nursed in a pouch situated on the abdomen of the mother. These are called *Aplacentaria*. It is apparent that this system of reproduction somewhat approaches that of birds and reptiles, in which the ovum or egg itself is produced and then hatched, usually by incubation. As we might expect from such a circumstance, the aplacentia are generally of a lower grade of intelligence than other mammalia.



THE TASMANIAN WOLF.

wonder when it was described as a "beaste that hath a bag under her belly in which she carries her young, at first no bigger than a raspberry, till they can shift for themselves." But this was only the beginning of wonders, for New Holland presents us with about sixty species of quadrupeds—carnivorous, frugivorous, and omnivorous—and nine-tenths of all are formed on the plan of the opossum: wolves, foxes, rabbits, squirrels, sheep, rats, mice—or creatures very much like them—and engaged, some in hunting and devouring other animals, some in climbing trees, some in flying through the air, some in grazing upon the earth, and some in swimming in the water—and the females of all carrying about their young ones in their pouches, which serve as cradle, bed, house, and home to the little family! Nor is this all: we have not only black swans and white eagles, singing pheasants, and a thrush that in consideration of its music is called a laughing jackass, but we find one quadruped that seems to be both an ant-eater and a porcupine, and another that is said to have the habits of a mole, the bill and feet of a duck, and the internal formation of a reptile! The two last, however, belong to a different order from that which we are now considering. Of the marsupialia, divided by some naturalists into several families, we shall make a brief enumeration, grouping them, for the sake of simplicity, into genera and species only.

Genus THYLACINUS: *Thylacinus.*—This includes the TASMANIAN WOLF, or ZEBRA OPOSSUM, or ZEBRA WOLF, *T. cynocephalus.* It is of the size of a small wolf, with short, smooth hair of a dusky yellowish-brown color, barred on the lower part of the back with sixteen black transverse stripes. It is the largest and most powerful carnivorous animal in Australia, is nocturnal in its habits, lives in retired caves, devours kangaroos and other small mammalia, and frequently commits depredations among the sheep. It is found only in Van Diemen's Land or Tasmania.

Genus DASYURUS: *Dasyurus.*—This includes the URSINE OPOSSUM, *D. ursinus*, called the *Native Devil* by the colonists; it is a voracious, burrowing animal of the size of a badger, found in Van Diemen's Land. It is eighteen inches long, with coarse, black hair, spotted with white. Its flesh resembles veal, and though once common, it is now scarce, in consequence of being killed for food.

The SPOTTED MARTIN, or LONG-TAILED DASYURUS, *D. macrurus*, is eighteen inches long, with a tail nearly as long as the body; its fur is chestnut-color, spotted with white. It feeds on small quadrupeds, and, when impelled by hunger, occasionally snaps up birds among the marshes.

Genus PHASCOGALE: *Phascogale.*—Of this is the *P. penicillata*, an opossum-like animal of the size of the brown rat, ash-colored above and white beneath, with a full tail; it is found in Australia, and lives on trees. There are several species, one no bigger than the common mouse.



THE SPOTTED MARTIN.

Genus MYRMECOBIUS: *Myrmecobius.*—This genus includes the Banded Ant-Eater, *M. fasciatus*, resembling somewhat both the ichneumons and the tupaias. It is about ten inches long, of a tawny color, marked with transverse bands of black and white. The female has no pouch, but the young adhere to the breasts, and are hidden by the thick fur. It is supposed to feed on ants.



THE BANDED ANT-EATER.

Genus CHŒROPUS: *Chœropus.*—This includes the Pig-footed Bandicoot, *C. ecaudatus*, found near Murray's River, in Australia; it is about a foot and a half long; the marsupial opening is downward instead of upward, as in the Kangaroo and others of the class; there are two toes only on the fore-feet, which resemble those of a pig, and there is no tail. Very little is known of its habits.

Genus PERAMELES: *Perameles.*—This includes the Long-nosed Bandicoot, *P. nasuta*, having a long head, with the upper part of the snout much prolonged: the tail is long and tapering; the fur gray-brown above and white beneath; the body eighteen inches long. A specimen of another species, the Rabbit Perameles, *P. lagotis*, has been in the gardens of the Zoological Society, London. The Blunt-nosed Bandicoot—the *Porcupine Opossum* of Shaw—*P. obesula*, resembles the preceding. These three species are found in Australia. The *P. Gunnii* is a native of Van Diemen's Land, where it is generally diffused. These animals all feed on insects, bulbs, grain, &c.

Genus DIDELPHYS: *Didelphys.*—This includes the numerous family of Opossums, which are only found in America. The Common American Opossum, *D. Virginiana*, is too well known to demand an extended description. It has a pointed head, wide gape, numerous sharp teeth, a rough tongue, ears large and naked, small eyes, the tail long, tapering, flexible, and pre-



LONG-NOSED BANDICOOT.

hensile; the toes are armed with sharp, strong, curved claws. Its size is nearly that of a cat, but the form is low and squat; the color is a grayish-white; the face, near the snout, pure white, the ears black. In its habits it is mostly nocturnal and arboreal, feeding alike upon insects, eggs, small birds, and fruits. It sometimes invades the barn-yards, and destroys the poultry, it is said, for their blood. It is a good deal hunted, and manifests much dexterity in escaping, by creeping



THE COMMON OPOSSUM.

away amid the grass, and sometimes pretending to be dead. In defending itself it bites severely. It is sluggish in its movements, and will sometimes lie on its back in the sun for hours; it often suspends itself from the brush of a tree by its tail. It is very prolific, producing from six to fifteen at a birth. The young at this period are well formed, and weigh from three to four grains each. As soon as produced, they are shoved into the pouch by the mother with her snout, and pushed near the nipples, which they find and grasp by instinct. Their growth is very rapid; at a week old they weigh thirty grains. They remain in the pouch, attached to the nipple, till they



THE OPOSSUM AND HER YOUNG ONES.

are able to move about. At the age of four weeks they occasionally leave the nipple and may be seen peeping out of their sack; a week afterward they venture forth, but keep close to the mother, and hold on to her by their tails. Sometimes with a dozen young ones of the size of rats, thus clinging around her legs, neck and body, and some of them dragging along on the ground, she may be seen going about in search of food. At this age these animals are pretty. They remain with the mother till about two months old; they then learn to take care of themselves, but continue in the vicinity, seeming still to be under maternal guardianship in a certain degree. Mean-



CRAB-EATING OPOSSUM.

time another breed is produced, and during the season a third, and some of all these may be seen at once with their prolific parent. In winter, if the climate is cold, the opossums become sluggish, but not torpid like the woodchuck. They are common in all the Southern and Southwestern States, and in California and Mexico. They are also found in the Middle States as far north as Pennsylvania, and sometimes in New Jersey.

This is the only animal of the kind known in the United States; in South America there are



THE CAYOPOLLIN OPOSSUM.

numerous species. The Crab-eating Opossum, *D. cancrivora*, is a large species, lives in marshy districts, and feeds on crabs. It is found in Guiana. Azara's Opossum, *D. Azaræ*, abounds in Brazil and other warm parts of South America. The Cayopollin Opossum or Naked-tailed Philander, *D. philander*, or *D. nudicaudata*, is found in Guiana. Nearly twenty other species of opossum are found in Brazil and other parts of South America.



THE YAPOCK.

Genus CHEIRONECTES: *Cheironectes.*—Of this there is a single species, the Yapock, *C. Yapock*, which resembles the otters, having palmated feet, and swimming with facility. Buffon calls it the *Little Otter of Guiana.* It feeds on small fishes and aquatic insects, and is found in Brazil.

Genus PHALANGISTA: *Phalangista.*—The animals of this genus, called *Phalangers*, are nocturnal, live in trees, have a prehensile tail, feed on vegetables and insects, possess an opposable nailed



THE SPOTTED PHALANGER OR COUSCOUS.

thumb on the hind-feet, and are found partly in Australia and partly in the Malasian Islands. It includes the Whatapooroo or Vulpine Opossum, the *Phalanger Renard* of the French, *P. vulpina*, resembling a fox in shape, the body twenty-six inches long and the tail fifteen, the latter prehensile, but covered with hair; the upper parts a grizly-yellow and the under parts tawny-buff; on the fore-feet, five toes and on the hind ones four, the feet, as in many of the opossums, serving the purposes of a hand. This species is found in Australia, near Port Jackson.

The Spotted Phalanger, *P. maculata*, is found in the Moluccas, and especially in Amboyna, where it is called *Couscous* by the natives. It is also met with at Wagiou, where the inhabitants call it *Scham-Scham*. Its fur is white, spotted with brown and black. The Red Phalanger, *P. cavifrons*, is found in Amboyna and Banda. The Golden-rumped Phalanger is also found at Amboyna; the *P. ursina* is found in Celebes.



THE SUGAR SQUIRREL.

Genus PETAURUS: *Petaurus.*—The *Petauristines*, sometimes called *Flying Phalangers*, are divided by some naturalists into several genera, but we shall include them in one. To this belongs the Sugar Squirrel or Norfolk Island Flying-Squirrel, *P. sciureus*, which is about as large as our red squirrel; the tail rather longer than the body; the fur soft and beautiful; the color gray



THE KOALA.

above and white beneath. In its form and habits it resembles our flying-squirrels, except that it has the abdominal pouch, like the rest of the order we are describing. It reposes during the day, but at evening comes forth, and supported by its lateral membranes, leaps and skims from tree to tree and from branch to branch with the greatest vivacity.

Among other species are the *P. breviceps*, *P. ariel*, *P. Australis*, all natives of Australia. The Dwarf Phalanger or Pigmy Acrobat, *A. pygmœus*, has soft, reddish-brown fur above and white beneath; the length of the body is but little over two inches; the tail is of equal length. This also is found in Australia.

Genus PHASCOLARCTOS: *Phascolarctos.*—This includes a single species, the Koala or Ashy-Coala or Colak, *P. cinereus*, which is as large as a moderate-sized dog. It has long, thick, and rather coarse fur, of an ashy-gray color; it moves with the gait of a young bear, lives in dens and holes dug with its feet, but spends much time in the trees. It is supposed to feed on vegetables and insects. The female produces one young at a time, which she nurses in her pouch till it is able to go abroad, when she carries it about on her back, bestowing upon it the most tender care. This species belongs to Australia.

Genus MACROPUS: *Macropus.*—We now come to the Kangaroos, the largest and most remarkable indigenous animals in the whole Australian world; among the most curious, indeed, in the animal kingdom. The species are numerous, from the size of a sheep to that of a rabbit, and are all distinguished by the structure of the hind-legs. These are exceedingly long and powerful, and the feet, which are much elongated, rest with the whole sole upon the ground; the fore-legs are very short, and are of little use to the animal in progression, its movements consisting in powerful leaps effected by the extension of the hind-legs. In its natural position the kangaroo sits upright upon its haunches with the assistance of its powerful tail, which, with the two hind-feet, forms a sort of tripod. In opposition to this great development of the hind parts of the body, all the fore parts are exceedingly small. The head is small, and furnished with large ears,



SKELETON OF THE GIANT KANGAROO.

and the upper lip is cleft. The dentition consists of six incisors in the upper jaw, but only two in the lower; the canines are always deficient in the lower jaw, and very small in the upper, where they are also sometimes wanting or concealed by the gums, so that there is always a considerable space between the incisors and the molars, which are five in number on each side, and of a more or less quadrangular form. The anterior feet are furnished with five toes, each of which is armed with a claw; the hind-feet, on the contrary, only possess four toes, the inner one or great toe being deficient. Of these the two outer are the largest, and are terminated by strong, hoof-like nails, while the inner ones are united together as far as the root of the nails. The stomach is of a complex structure, being divided by constrictions into several compartments, and Professor Owen has observed a sort of rumination to take place in some species. The kangaroos are almost entirely confined to Australia and Van Diemen's Land, but species are found in the adjacent islands, and even in New Guinea. They are entirely herbivorous, and live for the most part in the grassy plains; but some species are found in rocky places. They are timid creatures, but when seized defend themselves with violent strokes of their hind-feet, which, from their great power and the strength of their nails, constitute formidable weapons. Unlike the generality of herbivorous animals, however, they do not usually collect into flocks, although they may sometimes be seen in considerable numbers together. In feeding they rest upon the fore-feet, and when thus engaged, the young, which frequently retreat to the abdominal pouch long after they are able to graze like their parents, may often be seen protruding their heads, and cropping the herbage at the same time with their mother; they also sometimes run on all fours when pursued by dogs. Their ordinary mode of progression, however, consists in long leaps, effected by the



THE GIANT KANGAROO.

agency of the hind-legs alone, and in these efforts the long, powerful tail is employed in maintaining the equilibrium.

The largest of the species is the Giant Kangaroo, *M. major* or *M. giganteus*, first discovered by Captain Cook in 1789, and known to the colonists under the name of *Boomer*. It is of the size of a large sheep, and sometimes weighs one hundred and forty pounds. The period of gestation is thirty-nine days; the young one, when born, is a little over an inch long, and looks like a semi-transparent mouse. It is probably lifted by the mouth of the mother into the marsupium and placed near the nipple, which it then instinctively seizes. It remains here till it is able to go forth and feed upon grass; to this retreat it returns, and here it lives, till it is capable of taking care of itself. The flesh of the kangaroo is excellent, and the animal is much hunted, alike by the colonists and the natives; in some parts where they were once abundant, the larger species are already becoming scarce. The skin is made into leather for shoes and gloves. This species is found in Australia; it has been repeatedly bred in England.

The Sooty Kangaroo, *M. fuliginosus*: this is about the same size as the last species. Mr. Waterhouse thinks it will prove to be a variety of the *M. major*. He says: "The name Sooty Kangaroo is most ill-applied to the present animal, since its coloring is any thing but sooty, being for the most part of a brownish-yellow, rather bright on the sides of the body, and somewhat suffused with dusky-brown on the middle of the back."



THE SOOTY KANGAROO.

The Nail-tailed Kangaroo, *M. unguifer*, first described by Mr. Gould, has a nail-like, horny excrescence at the end of its tail. It is smaller than the foregoing species.

The Bridled Kangaroo, *M. frenatus*, is another nail-tailed species, discovered by Mr. Gould: its weight varies from ten to fifteen pounds.

The Crescent-marked Kangaroo, *M. auratus*, is about the size of a rabbit. It inhabits the Swan River district, Western Australia.

The Hare-Kangaroo, *M. leporoides*, is a pretty little animal, about the size of the common hare. Its powers of leaping are very extraordinary. "While out on the plains of South Australia," says Mr. Gould, "I started a Hare-Kangaroo before two fleet dogs; after running to the distance of a quarter of a mile, it suddenly doubled and came back upon me, the dogs following close at its heels. I stood perfectly still, and the animal had arrived within twenty feet before it observed me, when, to my astonishment, instead of branching off to the right or the left, it bounded clear over my head, and on descending to the ground I was enabled to make a successful shot, by which it was procured."

The Spectacled Kangaroo, *M. conspiscillatus*, is distinguished from the last by its ears being considerably shorter, the more brilliant rusty-red coloring round the eye, and the want of a black patch at the base of the fore-leg; the muzzle likewise is more obtuse.

The Banded Hare-Kangaroo, *M. fasciatus*, is about the size of the common hare, and has very long and soft brown-gray hair. It is very shy and timid, inhabiting the thick brush of Western Australia.

The *M. hirsutus* is about the size of the common hare. It inhabits Western Australia, where it is known to the natives by the name of *Woo-rup*.

The Antilope-Kangaroo, *M. antilopinus*, is a large species, nearly the size of *M. giganteus*. It is characterized by being clothed with short, stiff hairs, which lie close to the skin, as in many of the antilope tribe. It inhabits North Australia.

The Yellow Wallaroo or Isabelline Kangaroo, *M. Isabellinus*, has been described from a flat and imperfect skin procured by Mr. Gould at Barrow Island.

The Great Rock Kangaroo, *M. robustus*—the *Black Wallaroo* of the colonists—inhabits the mountain ranges in the interior of New South Wales. The male and female differ in size and



THE POTOROO RAT. (See page 676.)

color. The male equals in weight the Giant Kangaroo, and is of a black color, while the female is a small, delicate creature, of a silver-gray color.

The Red Buck, *M. rufus*, is the male of a species of which the female is called "Blue Doe" and also "Flying Doe." It is as large as *M. giganteus*. It is dispersed over the great basin of the interior of Australia.

The Agile Kangaroo, *M. agilis*, inhabits the north coast of Australia. It is very fleet, and eludes the dogs employed in hunting it, by its extreme activity in leaping over the high crags. The color of the fur is sandy-yellow, but the back is pencilled with black.

The *M. Parryi* inhabits New South Wales; it is a large species, of a silver-gray above and white beneath.

The Black-gloved Kangaroo, *M. Irma*, is a native of Western Australia. It runs very fast, is about thirty-one inches in length, or half the size of the *M. giganteus*, and abounds in the Swan River district.

The *M. Greyi*, named after Captain G. Grey, who presented two specimens to the British Museum, inhabits South Australia.

The Red-necked Kangaroo, *M. ruficollis*, inhabits New South Wales and King's Island.

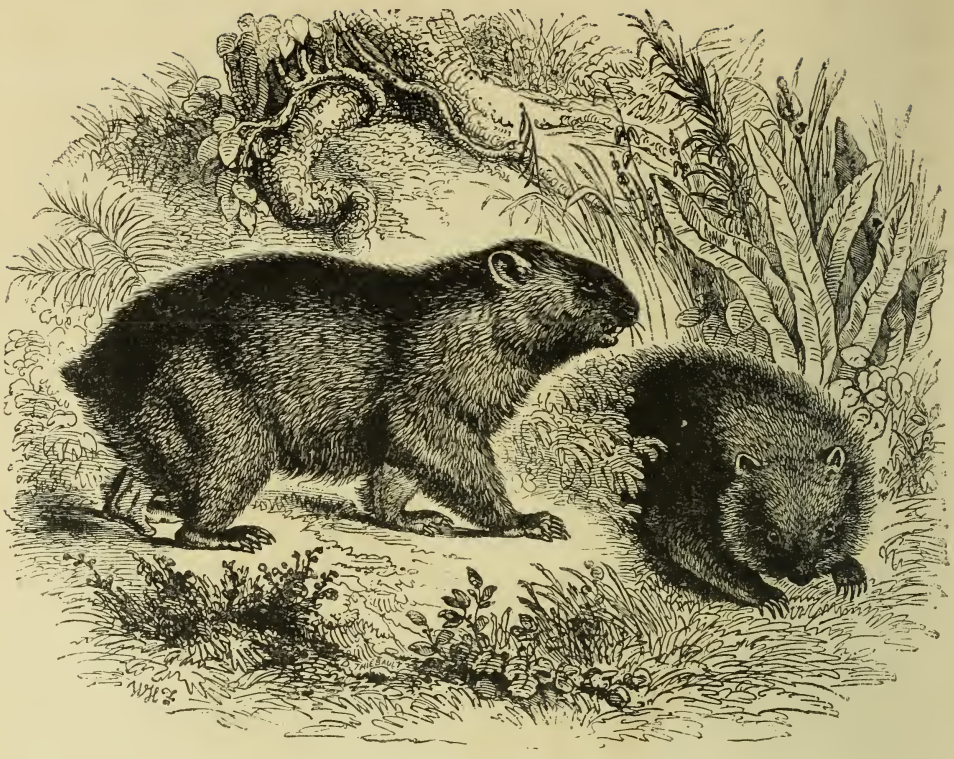
The Black Wallaby or Black-tailed Kangaroo, *M. Ualabatus*, is an inhabitant of New South Wales.

The *M. Eugenii* inhabits Western Australia.

The Pademelon Kangaroo or Pademelon Wallaby, *M. Thetides*, inhabits New South Wales. It is a small species, about twenty inches in height when sitting. It is highly prized as an article of diet.

The Parma Kangaroo, *M. Parma*, inhabits New South Wales.

The Black-striped Kangaroo, *M. dorsalis*, like the last is found in the scrubby districts of New South Wales. This species is eaten, and its skin is used for clothing.



THE WOMBAT.

Derby's Kangaroo, *M. Derbianus*, inhabits Western and Southwestern Australia, and is about the size of the last.

The Red-bellied Kangaroo, *M. Billardierii*, is a native of Van Diemen's Land. It is a gregarious species, hundreds of them inhabiting the same locality. It is called by the colonists the *Wallaby*.

The Short-tailed Kangaroo, *M. brachyurus*, inhabits the region of King George's Sound.

The Brush-tailed Rock-Kangaroo, *M. penicillatus*, inhabits New South Wales, and its flesh is said to be most excellent. It is a gregarious and nocturnal species, dwelling in rocky districts, and remarkable for its power of leaping from rock to rock.

The Black-flanked Rock-Kangaroo, *M. lateralis*, inhabits Western Australia, the Swan River district, and is nocturnal in its habits, and remarkably shy.

The *M. inornatus* inhabits the north coast of Australia.

The Short-eared Rock-Kangaroo, *M. Brachiotis*, inhabits the northwest coast of Australia.

The *M. concinnus* is also found in the same districts.

Le Brun's Kangaroo, *M. Brunii*, was the first of the Marsupiata with which naturalists became acquainted, having been described by Le Brun as early as 1711. It is an inhabitant of New Guinea.

Genus POTOROO: *Hypsiprymnus*.—This includes the Potoroo or Kangaroo Rat, *H. murinus*, which is a mild, timid creature, of the size of a rabbit; the body is formed somewhat like that of a rat, but the fore-legs are exceedingly short and the hind ones long, so that the animals move by long leaps on the latter, like the kangaroos. They burrow in the ground and feed on vegetables.

Other species, to some of which Gray gives the name of *Bettongia*, are the *H. melanotis*, *H. cuniculus*, *H. Grayi*, *H. Gaimardii*, *H. penicillatus*, *H. Gilbertii*, *H. platyops*. All the species are of Australia.

Genus HALMATURUS: *Halmaturus*.—These resemble the kangaroos, but differ from them

in having shorter ears, and a tail nearly naked. The *H. elegans*—the *Kangurus fasciatus* of Péron and Lesueur—is of the size of a large hare, of a mouse-gray color, haunts thick bushes, and forms long galleries in the earth. It is found in the island of St. Pierre.

Genus PHASCOLOMYS: *Phascolomys.*—Of this there is a single species, the WOMBAT, *P. Wombat*, a short-legged, thickset animal, the body two feet long, the tail half an inch long. It lives in burrows and feeds on vegetables. It is covered with coarse hair of a sandy-brown color; its eyes are small and lively. Its pace is shuffling and hobbling, like that of a bear. It has little intelligence, but its disposition is mild. The flesh is said to be excellent. Several living specimens have been in the menageries of Europe.



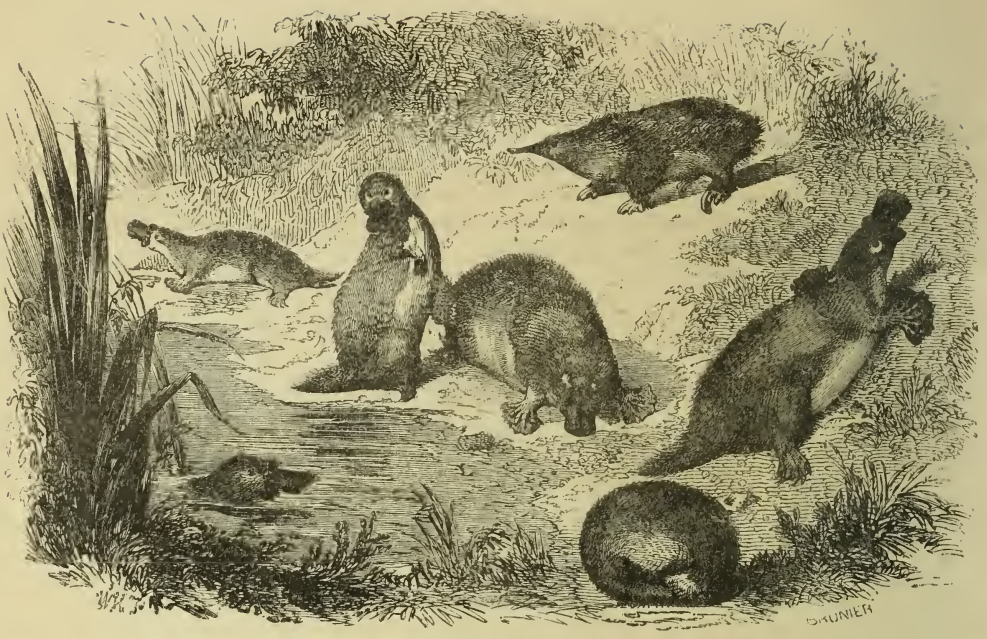
THE ROSTRATED TARSIPEDE.

Genus TARSIPEDES: *Tarsipes.*—Of this there is only a single species, the ROSTRATED TARSIPEDE, a small, pretty, mouse-like animal, about three inches long, having a rostrated or beak-shaped snout, with a long prehensile tail. It lives on insects and the nectar of flowers, and is found in the Swan River country, Australia.

ORDER 14. **MONOTREMATA.**

These animals, whose name is derived from the Greek *monos*, signifying *one*, and *trema*, an *orifice*, in allusion to their organic structure, have in several respects a resemblance to birds. The head is extremely small, and the facial bones project into a beak-like form; the eyes are small, and the external ear altogether wanting. The feet have five toes covered with long nails, and the males are furnished with spurs on the hind-legs. There is no abdominal pouch, as in most marsupiata, but the young are produced alive, in a very immature state; the female has no nipples, but in their place are slits, through which the young draw their milk. There are three known species, all natives of Australia.

Genus ECHIDNA: *Echidna.*—In these animals the snout or beak consists of a nearly cylindrical organ, of which both mandibles are inclosed in a continuous skin, except just at the apex, where there is a small orifice to allow of the protrusion of the tongue. This latter, by an arrangement similar to that in the true ant-eaters, is capable of being extended and contracted to an immense extent, so that it may be exserted from the mouth to a length of nearly eight inches, and retracted till it is entirely concealed. The jaws are destitute of teeth, and the nostrils are placed at the end of the snout. The legs are short and strong, and the feet all furnished with five toes,



MONOTREMATA.

armed with powerful claws, but destitute of swimming membranes. The body is short and thick, the tail is reduced to a very small size, and the skin is clothed with bristly hairs, intermixed on the upper surface with numerous short, acute spines, very similar to those of the hedgehog. The structure of the mammary glands of the female, and the spurs on the hind-legs of the male, are such as we have described as characteristic of the order.

The Porcupine Ant-Eater, *E. hystrix*, measures from fifteen to eighteen inches in length, and is found generally in hilly countries, where it lives in burrows and feeds upon insects, principally ants and termites, which it captures by the protrusion of its long sticky tongue. It is a slow, dull, nocturnal animal, but exhibits a wonderful activity in digging, for which its powerful claws are admirably adapted. When surprised, it either makes its escape by burrowing into the earth, or rolls itself up in the manner of a hedgehog so as to present its spiny covering to the enemy. It is found in New South Wales. The *E. setosa*, the only other known species, resembles the preceding, and is considered by some naturalists as merely an old variety of it; it is found in New South Wales and Van Diemen's Land.

Genus ORNITHORHYNCHUS: *Ornithorhynchus.*—Of this there is but a single species, the Duck-billed Platypus, Mallangong, Tambreet, or Mouflengong, *O. paradoxus*, which seems to cap the climax of eccentricity in the zoology of Australia. Its jaws resemble a flattened duck's bill, opening freely to a considerable extent, and covered with a thick skin. Near the base the jaws are furnished on each side with a sort of horny tooth, which, however, is quite destitute of a root. The tongue is divided into two parts, of which the hinder is broad and flat, covered with soft papillæ, while the anterior portion is narrow and covered with upright points, which become longer and sharper toward its tip. The nostrils are placed at the apex of the upper mandible. The body is about fifteen inches long; the skin is covered with a short brown fur, which extends also upon the short, flattened tail. The legs are short, each being furnished with five toes, which are united by a membrane; this, on the anterior feet, projects in a semicircular form beyond the extremities of the claws. The spurs on the hind-legs of the male are of considerable size, but they seem never to be used in self-defense.

This extraordinary animal, which was supposed by its first describer, Dr. Shaw, to be a manufactured monster, is found in New South Wales and Van Diemen's Land, where it inhabits ponds and the quiet parts of streams. In these places it swims about on the surface of the water, with



THE PORCUPINE ANT-EATER.

the head a little raised, diving continually in search of insects and other small aquatic animals on which it feeds. It is also able to climb with facility, and may often be seen in small parties resting on trunks of trees overhanging the water. It digs itself a burrow in the banks of the piece of water frequented by it, making it with two openings, one above and the other a little



THE ORNITHORHYNCHUS.

below the surface of the water. The burrows are of great extent, usually from twenty to thirty-five feet in length; these rise from the water toward the surface of the earth, and, at the furthest part, which is also the highest, are slightly enlarged and provided with a sort of nest for the reception of the young. These, when born, are quite blind and nearly naked. They are produced and nursed as in the preceding genus.

CONCLUSION.

We have thus concluded our view of the MAMMALIA, that great and important Division of Animated Nature to which MAN himself belongs, and which includes by far the larger portion of the animals which are associated with man in a state of domesticity, as well as those which in a wild state attract his attention, whether as objects of the chase, or enemies which dispute his supremacy. We shall next proceed to the Birds, which, though they may be less essentially connected with the necessities and pursuits of mankind, are still objects of perhaps even greater curiosity and more lively interest.



END OF VOLUME I.

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